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REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS FOR THE PERIOD JANUARY TO JUNE 1999

REPORT NO. 21

DATA ASSIMILATION,
METEOROLOGICAL OFFICE,
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JANUARY TO JUNE 1999

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For further information on or copies of this report, please contact:

Manager of Observation Monitoring,
Room 343,
Meteorological Office,
London Road,
Bracknell,
Berkshire,
United Kingdom.
RG12 2SZ

E-mail: bmacpherson@meto.gov.uk

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1. INTRODUCTION

In 1985, the Commission for Basic Systems agreed that there was a need for GDPS / Global NWP centres to monitor the quality of observations available on the GTS and to exchange monthly lists of those stations providing observations which seem in error. In 1988 three lead centres were nominated which would have a co-ordinating role of producing, at 6-monthly intervals, consolidated lists of suspect stations for given data types together with information on the nature of the error. RSMC Bracknell was allocated the role as lead centre for marine surface observations which encompasses observations from ships, drifting buoys, moored buoys and other fixed marine platforms. This is the twenty-first such report and covers the period January to June 1999.

Following the CBS recommendations, four centres have been active in exchanging monitoring information each month; RSMC Bracknell since August 1987, ECMWF since August 1988, RSMC Tokyo since September 1988 and NCEP Washington since August 1989. At first, the only monitoring information exchanged on marine surface observations related to pressure, and the first two WMO reports were restricted to that parameter alone. All four centres now regularly monitor wind observations and such results are contained in this report. In addition, the report contains monitoring results for sea-surface temperature (SST). Due to changes which have been made to the observation processing system and database structure at Bracknell, however, there has been no monitoring of SST data at this centre since May 1998. For this reason, the SST information presented herein, has been compiled, with permission, from the monthly NCEP monitoring reports and is not, therefore, directly comparable with that in previous reports. It is now hoped that this situation will be resolved in time for the inclusion of SST monitoring statistics from RSMC Bracknell in future reports, as of number 23.

For each marine observing platform which is identified as suspect, values are supplied for the number of observations received at each centre, the number of observations with gross errors, the mean differences from the background values used by the numerical data assimilation system and the standard deviations of these values.

2. MONITORING METHODS

Errors in observations may arise from a number of sources: the instrument may be malfunctioning, figures may be mistaken while being transferred manually, or there may be corruption of data during transmission. Errors can also arise in the pressure report if the adjustment to sea level is made incorrectly or not at all, and a poorly sighted anemometer can result in errors in the observations of wind. For SST observations, the depth at which the observation is made can be crucial. "Surface" observations from buoys are usually made at a depth of around 0.5m, whereas ships may take a measurement between a depth of 10m and the surface, depending on the method used. At present, there is no indication given within the report of the observation's depth, so it is not possible to determine the significance of this factor. (By contrast, satellites measure the temperature of the ocean's "skin" which is generally slightly cooler than the temperature immediately beneath, by several tenths of a °C, as a result of evaporative cooling and other surface processes.)

Some errors can be detected by applying checks on the code format and the internal consistency of the report (for example: are the position and pressure consistent with a report 6 hours earlier?). Checks on spatial consistency may be made if there are other nearby observations. However, such quality checks are unable to identify errors on all occasions and it is recognised that the numerical data assimilation systems in use today can provide global reference values which have a valuable application in the area of observation monitoring. The short-term forecast from the previous numerical analysis, commonly known as the first-guess or background field, provides perhaps the most useful information on observation quality, as it represents an accurate and spatially consistent estimate of the observed value which is independent of the observation itself. Observation-minus-background (hereafter referred to as O-B) differences are at the core of all monitoring work by GDPS centres. For sea-surface temperature, it has not, in previous reports, been possible to use a background field with which to compare the observed values, as is done for wind and pressure observations, since no forecast of SST is performed at Bracknell. Instead, the analysis field has been used, the slowly varying nature of SST, relative to parameters measured above the surface, making this a sufficiently good approximation. (These analyses are performed daily at RSMC Bracknell from an assimilation of both surface and satellite observations.) There is one drawback in using the analysis field as an alternative: it is dependent upon the observations themselves. This is a major limitation when it comes to assessing observation quality since the results are not straightforward to interpret. Since, however, the SST information presented in this report is derived from the monthly NCEP monitoring reports, it is based on the O-B data therein.

Taking all marine surface observations together, the values of O-B have distinct characteristics. The vast majority of the observations show quite small departures from background and the distribution of O-B is nearly Gaussian, with little or no bias. The errors in the background field probably contribute most to the values of O-B for these observations. There is often, however, a smaller group of observations departing much more from the background, for which observation error is the only reasonable explanation for the large values of O-B. Studies of the distribution of O-B and its variation at different points around the globe enable reasonably accurate estimates of background error to be made, and this provides the basis for the monitoring methods described here. Those marine observing platforms for which, in a sufficiently large sample, the observed values of pressure or wind differ from the background by an amount significantly in excess of the estimate of background error, may be labelled as suspect with a high degree of confidence. The limits used here to identify suspect observing platforms have been set sufficiently stringent to preclude much likelihood of the background, rather than the observations, being in error.

Each monitoring centre produces a monthly list of the identifiers of marine observing platforms considered suspect according to the departure from the centre's background values. All observations, both synoptic and asynoptic, are assimilated. At Bracknell, Tokyo and Washington, the corresponding background value used is that valid at the nearest main synoptic hour. At ECMWF, however, interpolation in time is performed.

Given that the number of observations made during the month is greater than or equal to 20, then the condition used by all centres for obtaining platforms for the suspect lists is that at least one of the following criteria are satisfied:

Pressure

1. the | mean of O-B |	≥ 4.0 hPa	
2. the standard deviation of O-B	≥ 6.0 hPa	
3. the percentage of gross errors	≥ 25	

Wind

1. the | mean of O-B |	≥ 5.0 ms^{-1}	(Speed)
	≥ 30°	(Direction)
2. the standard deviation of O-B	≥ 80°	(Direction)
3. the percentage of gross errors	≥ 25	

A gross error is defined as an observation which departs from the background by more than 15hPa (Pressure) or 25ms^{-1} (Vector Wind). The mean and standard deviation of the samples are evaluated excluding gross errors and in this way occasional 'wild' values resulting from, for example, corruption during transmission, do not influence the sample characteristics. Direction statistics are also calculated excluding values in light winds, where either the observed or background speed is less than 5ms^{-1}.

Relatively little information is exchanged between centres on a regular monthly basis for SST.

The monthly results for pressure from all four monitoring centres show considerable agreement, both on the observing platforms listed as suspect and the values of the mean and rms difference from each centre's background. Differences between the monthly suspect lists are usually due to the different numbers of observations available at each centre. The cut-off varies between 6 and 24 hours. There are also some unexplained variations in the data receipt between the centres, which may be due to problems in the GTS or in the local procedures for handling the data. Monitoring results for wind speed also show reasonable agreement on the mean and standard deviation from each centre's background; there is less agreement as to which platforms are listed, reflecting the greater uncertainty when monitoring wind speed.

This report draws together all the monthly monitoring results exchanged on marine surface data and identifies a list of observing platforms which have provided observations of poor quality over the 6-month period. In drawing up this list, there have been a number of guiding principles:

1. As with the monthly lists, accuracy is assessed relative to background values.
2. Only those observing platforms are listed for which there is a very high degree of confidence that the observations rather than the background values are in error.
3. At least 40 reports are required over the period in which the observations are considered suspect.
4. The perceived accuracy over the last part of the six-month period is of greatest importance; observing platforms will not be listed if there has been recent improvement and their reports are at present without major error.
5. Given that the number of observations made during the period is greater than or equal to 40, then the condition for listing a platform as suspect in this report is that at least one of the following criteria are satisfied:

Pressure

1. the | mean of O-B |	$\geq$ 3.5 hPa
2. the standard deviation of O-B	$\geq$ 5.0 hPa
3. the percentage of gross errors	$\geq$ 25

Wind

1. the | mean of O-B |	$\geq$ 5.0 ms^{-1}	(Speed)
	$\geq$ 30°	(Direction)
2. the standard deviation of O-B	$\geq$ 6.0 ms^{-1}	(Speed)
	$\geq$ 60°	(Direction)
3. the percentage of gross errors	$\geq$ 25	

SST

1. the | mean of O-B |	> 4.0 °C
2. the standard deviation of O-B	> 6.0 °C
3. the percentage of gross errors	$\geq$ 25

All observations having gross errors are excluded from the calculation of the mean and standard deviation of O-B. The same gross error limits apply in these reports as in the monthly lists. RSMC Bracknell normally set a limit of 5 °C for SST, although this does not apply to the data presented in this report since the monthly statistics from NCEP are based on a limit of 15 °C. This is one of the reasons why this data is not directly comparable with that presented in previous reports. Additionally, the criteria previously used by RSMC Bracknell for these reports have been based on rms O-A and gross errors only. Aside from this, even if the same monitoring methods were used at Bracknell and NCEP, there would always be a risk associated with treating the results obtained using different models as comparable.

The limits set on the bias and standard deviation of O-B are slightly less stringent than those for the monthly lists because the sample sizes are larger. They are only applied over the last part of the period if there has been a recent deterioration in quality. It is possible that there are a few observing platforms listed in this report which have not appeared on any of the monthly lists. This can occur if they report infrequently and only produce a large enough sample over a period of several months or if deterioration occurs at the end of the period; for a platform which reports very frequently. The 6-month list is longer than most of the monthly lists because many ships cease reporting for variable periods of time, presumably in most cases while they are in port or out of service. Only over a relatively long period, probably more than 6 months, is a representative sample obtained from all those ships providing observations.

3. MONITORING RESULTS

The monitoring results presented in this report relate only to data exchanged over the GTS. Observations from marine platforms are transmitted in one of two formats: the SHIP code, used for most observations from ships, moored buoys and other fixed platforms, and the BUOY code, used mostly for observations from drifting buoys. In this report the term "ship observations" refers to those received in the SHIP code and the "drifting buoy observations" to those received in BUOY code. The SHIP code indicates whether the observation was made manually or by an automatic system and accordingly the sub-divisions "manual ship" and "automatic ship" will be defined.

N.B. During the period of this report there has been no monitoring of SST data at RSMC Bracknell although SST information is presented, with permission, which relates to the monthly monitoring reports from NCEP. This situation has arisen due to the changes which have been made in the observation processing system at Bracknell and the consequent changes to the databases used for monitoring. It is now hoped that the monitoring of SST data will be resumed, giving monitoring results for use in these reports, during the period January to June 2000.

3.1 Pressure

In the six month period, January to June 1999, 1 596 800 observations of pressure were monitored at Bracknell from 5882 manual ships, 370 drifting buoys, and 326 automatic ships. The number of reports received from individual ships varies greatly as Table 1 demonstrates; apparently, a large percentage only report once. The reason for this is unclear but it may be a result of errors in the part of the message giving the ship identifier. A comparison with the corresponding table in report number 20 shows an increase in the numbers of identifiers being reported for all three identifier types, with numbers of manual ship identifiers recovering to 1996 / 1997 levels. Since most marine observations are located in the northern hemisphere, there is inevitably some seasonal variation in the number of vessels reporting, especially in the case of buoys, since new or replacement buoys are generally deployed in better weather conditions. By considering the general trends over previous reports, however, a recent stabilisation in numbers of drifting buoy and automatic ship identifiers is evident, following an approximately 25% reduction in1998.

Table 2 shows the number of observations of pressure that have been received over the GTS at Bracknell and processed, over past 6-month periods. Due to changes in data storage methods at Bracknell in May 1991, report number 5 covered the period January to May 1991 only, thence figures for January to June 1991 have been scaled-up in order to make a fair comparison with other 6-month periods; this may not be entirely accurate. Further changes in November 1993 for drifting buoys and automatic ships for pressure and winds, may have allowed duplication of a few identifiers in totals for the period June to December 1993, as reclassification from one observation type to another occurred. The observation distribution shown in Table 2 will also have been affected in the long term with a slight shift towards drifting buoys; no duplication of observations occurred however. SST observations were not affected by the November 1993 change. The period January to June 1998 is also based on only 5 months data (February-June), but the numbers of observations received have been scaled up, as in the 1991 case.

Figure 1 shows the information presented in Table 2 more clearly. It can be seen that the total number of observations remained fairly steady with only minor fluctuations until report number 11 (January-June 1994). Since that time however, there has been a steady increase in the total, with the number of observations of pressure nearly doubling between reports 11 and 16 (July-December 1996), a period of just 2.5 years. This increase was due to the increase in the number of reports from each drifting buoy, as reliability has improved; many drifting buoys now make over 2,000 pressure observations during a 6-month period. The number of reports from drifting buoys now exceeds those for manual ships by around 60%, with a little under half of all marine pressure observations now being made by drifting buoys. The sudden increase seen in the number of automatic ships in report number 19 (January-June 1998) was due to observation processing

changes at Bracknell, whereby all reports from 'automatic ships' are processed, rather than only one report per 6-hour assimilation period, as previously.

A histogram of O-B differences for all ship pressure reports in the period January to June 1999 is shown in Figure 2a, together with the Gaussian distribution with the same mean and standard deviation. Although almost all values fall within the range +5 to -5 hPa, a small number of much larger values, presumably resulting from erroneous observations, contribute to the large standard deviation of the population. The distribution for all those observations which fail the automatic quality-control checks is broad (Figure 2b). The remaining 96 per cent of the observations which pass the quality checks show a distribution of O-B which is very close to Gaussian (Figure 2c) with mean -0.2 hPa and standard deviation 1.5 hPa; the principal contribution to the standard deviation is assumed to be from background errors.

A global estimate of the background error, such as that provided above, will conceal large spatial variations which may occur. Background values will be more accurate in data-rich areas (e.g.: in the North Sea or Mediterranean) or where the meteorological variability is low (e.g.: the tropics). The geographical distributions of the mean and standard deviation of the values of O-B from all ship observations which pass the quality-control checks, have been calculated for 10-degree latitude-longitude boxes and are plotted in Figures 3 and 4. In most areas the magnitude of the mean is less than 0.5 hPa, the exceptions being generally where the sample size is small. The standard deviation is generally around 1.5 hPa, but larger in the southern oceans, around 2.5 hPa. The number of ship pressure reports accepted by the model quality control in each 10-degree box is shown in Figure 5.

Table 3 contains a list of those ships and drifting buoys considered to have produced suspect observations of pressure in the period January to June 1999. Values over the six month period are given for the number of observations of pressure available for the Bracknell global model runs, the number of observations differing from the background value by more than 15 hPa (gross errors), and the mean and standard deviation of O-B using the Bracknell global model. The number of times the identifier has appeared on the monthly suspect lists from the four monitoring centres is also given. In order to give a detailed picture of the frequency of reporting and any changes in the observation accuracy, 6-month time-series of O-B differences are given at the end of the report for each of the identifiers listed.

An interesting characteristic of the errors identified here, which soon becomes obvious on inspection of the time-series charts at the end of this report, is that the majority can be attributed to a bias in the observed pressure. In many cases the bias is constant over the whole monitoring period. There are some values which appear to depart greatly from the sample mean, presumably due to some gross error in the observation, but generally they are isolated instances. In only a few cases are there regular large random departures from background. Those observing platforms listed in Table 3 which appeared in report number 20 (July to December 1998) have been indicated with an asterisk. A comparison of the statistics given here with those in the report number 19 (January to June 1998), clearly indicates that the bias in the pressure observations from a few ships has hardly changed for more than a year.

Statistics for those marine observing platforms which were listed in report number 20 and which do not appear in Table 3b, are given in Table 4 along with comments on the quality of their pressure observations. Time-series charts of the pressure observations from these platforms are not given. Less than 40 reports were received in the 6-month period for a majority of the ships on this list. However, approximately 40% of the ships show some improvement in the quality of their observations.

3.2 Wind

The monitoring of observations of wind, presents more problems than for pressure. On the majority of observing platforms, wind is measured using anemometers; the reported speed is dependent upon the averaging period and the height of the instrument above sea level, which varies a great deal from platform to platform. Since wind flow is distorted by large structures, factors affecting the wind measurement also include the siting of the anemometer and the bearing of the wind with respect to the structure. (The factors outlined above do not apply to those ship observations where wind speed is based on visual estimates of the sea state.)

In these monitoring results, the background winds are valid at a height of 10 metres above mean sea level; slightly lower than the average height of ship anemometers. Where anemometer height is much different from 10 metres, a significant O-B speed bias may be evident. Examples of this are, observations from oil rigs or tankers with anemometer heights of 50m or more and buoys, where the anemometer can be as low as 2m.

In the period January to June 1999, 1 015 488 wind observations were available for monitoring at Bracknell, from 5698 manual ships, 126 drifting buoys, and 357 automatic ships. (More detail is given in Table 1.) The number of reported manual ship identifiers has increased by approximately 15% since the last report, to a level similar to that last seen in 1993 / 1994. Also, the downward trend in numbers of automatic ship identifiers is continuing, with a slight fall since the last report. Over the same period, the number of reported drifting buoy identifiers has decreased by around 15% but is still greater than for any period prior to 1998, probably due to the larger proportion of buoys now being deployed carrying anemometers. As stated for pressure observations, the large increase in the number of monitored wind observations, seen in report number nineteen, was largely due to the inclusion of all 'automatic ship' data, not just one report in each six hour period.

Histograms of O-B differences for ship observations of wind speed are presented in Figures 2d to 2f and of wind direction in Figures 2g to 2i. As with observations of pressure, those wind observations which fail the quality-control checks differ most from background, some by as much as 50 ms^{-1}, and they make a large contribution to the variance of O-B. The distributions of O-B wind speed and direction for the remaining 90 per cent of the observations are nearly Gaussian. There is a speed bias of +1.1 ms^{-1} relative to background, with a direction bias of just –1.9°.

Figures 6 and 7 show the geographical distributions over the six-month period of the mean and standard deviation of O-B for ship observations of wind speed which pass the quality-control checks. The numbers of wind reports used to generate these statistics are presented in Figure 8. The standard deviation of O-B wind speed is typically 2.5 to 4 ms^{-1} in middle latitudes and 2 to 3 ms^{-1} in the tropics. The bias is generally around +1 ms^{-1}, but exceeds +2 ms^{-1} in a few places. Similar distributions of the mean and standard deviation of O-B wind direction are shown in Figures 9 and 10. Only reports where both the observed and background wind speeds are greater than 5ms^{-1} were used to obtain these values. The magnitude of the bias is less than 10 degrees in most places. The standard deviation is generally between 20 and 30 degrees globally, but in some data-sparse areas it is as large as 40 or 50 degrees. The numbers of reports of wind direction used to generate these statistics are presented in Figure 11.

Figures 6-11 provide reference values against which the characteristics of O-B for different marine observing platforms may be compared. Table 5 contains a list of those ships and drifting buoys considered to have produced suspect observations of wind speed in the period January to June 1999, and in Table 7 a similar list is provided for wind direction. Values are given for the number of observations of wind received at Bracknell, the number of observations having a vector difference from background of more than 25ms^{-1} (gross errors), and the mean and standard deviation of O-B. Time-series of O-B for each identifier listed are given at the end of the report. In half of the cases of suspect speed observations, a constant bias is clearly evident. Errors in observations of direction are more random in nature. Tables 6 and 8 contain statistics for platforms which are not included in Tables 5 and 7 but that were listed in the previous report, for wind speed and direction respectively. Time-series plots for these identifiers are not included in this report.

3.3 Sea-surface temperature

Since there has been no monitoring of SST observations at Bracknell during the period covered by this report, the results presented here, derived, with permission, from the monthly suspect lists published by NCEP, are much less comprehensive than those in previous reports. It has not been possible, for instance, to identify how many observations of SST have been received over the GTS or how many of each observation platform type have been operational during the period (as indicated in Table 1). Usually, however, drifting buoys provide a substantial proportion of the total number of SST observations received, despite their numbers being relatively low. This is due to the frequency of buoy observations; hourly in many cases, with ships tending to report only at the main synoptic hours.

It has not been possible to produce any of the figures normally used to represent SST statistics; observation numbers, mean O-A, standard deviation O-A. These typically show overall biases of small magnitude (≤ 0.1 °C) for all observation types. It is usually the case that ship observations have a standard deviation O-A which is approximately double that for both fixed and drifting buoys. This is partly due to both the frequency of buoy reports, relative to those from ships, and their quasi-constant location, giving them increased weight in the analysed field. As a result of the small number of SST observations at high latitudes and hence, particularly in the Southern Hemisphere, the decreased reliability of the analysis, the largest O-A biases tend to occur in these areas. (The coverage provided by drifting buoys is extensive, the exception being tropical areas of the Atlantic, and the Polar Regions. Fixed buoys, however, tend to be largely concentrated in coastal regions, with particularly high observation densities around the UK and the USA, as well as Japan and Hawaii.)

Table 9 contains a list of the ships and drifting buoys considered to have produced suspect observations over the 6-month period. The comments given in each case provide an indication of the main reason for the station to be listed as suspect; for the reasons mentioned previously, time-series charts for SST have not been included in this report. The majority of the identifiers appearing on the list do so as a result of bias. As in report number 20, the normal form of Table 10 has not been used, since statistics for the whole of the current period are not available. Instead, Table 10 shows those identifiers listed as suspect in the monthly NCEP report for June 1999, for which there is insufficient information to make a judgement as to the quality of the observations over a longer period.

4. SUMMARY

95 marine observing platforms are listed as producing suspect observations of pressure over the period January to June 1999, and 45 as producing suspect wind observations. 35 platforms are listed as producing suspect SST observations, as assessed from the monthly NCEP monitoring reports. The first report issued by RSMC Bracknell for the period January to June 1989, listed 150 marine platforms producing suspect observations of pressure. With the selection criteria remaining unchanged since then, an initial reduction in the number of platforms listed as suspect has been followed by a series of reports listing similar numbers of suspects. This still, however, seems to reflect an overall improvement in observation quality, when considered alongside the large increases, over the same period, in the number of observations monitored for each report. Although this report, and report number 20 have identified larger than usual numbers of observing platforms producing suspect wind observations, this still represents less than 1% of the total number of operational observing platforms which report wind data.

The most common characteristic of the pressure errors found here is a bias in the reported pressure which may remain constant for many months. The majority of platforms listed as producing suspect wind observations show a bias in the reported wind speed, while a few show large standard deviations for wind direction. For sea-surface temperature observations, the presence of bias is again found to be the most common cause of error.

The selection criteria have been set sufficiently stringent to ensure that the platforms listed are only those for which there is a high degree of confidence in their reports having errors. There are a great many others, not listed here, for which there must be considerable doubt over the quality of the observations. A wider range of monitoring results is available from Bracknell on request.

TABLE 1: FREQUENCY DISTRIBUTION OF THE NUMBER OF REPORTS OF PRESSURE, WIND AND SEA SURFACE TEMPERATURE FROM INDIVIDUAL IDENTIFIERS AVAILABLE FOR MONITORING AT BRACKNELL, JANUARY TO JUNE 1999.

Number of reports	Number of manual ships reporting			Number of drifting buoys reporting			Number of automatic ships reporting		
	Press	Wind	SST	Press	Wind	SST	Press	Wind	SST*
1	2803	2188	-	52	45	-	178	145	-
2-10	706	1026	-	27	28	-	40	57	-
11-20	235	231	-	11	8	-	2	3	-
21-40	340	350	-	11	5	-	1	2	-
41-100	614	599	-	18	8	-	6	9	-
101-200	584	618	-	27	4	-	11	13	-
201-500	532	610	-	40	2	-	28	52	-
501-1000	37	47	-	58	4	-	24	50	-
1001-1500	20	22	-	67	8	-	28	15	-
1501 +	1	7	-	60	14	-	8	11	-
Total	5882	5698	-	370	126	-	326	357	-
(Report 20)	*(5300)*	*(4978)*	*(-)*	*(365)*	*(148)*	*(-)*	*(313)*	*(384)*	*(-)*

* numbers are for automatic (fixed) buoys only

TABLE 2: NUMBER OF OBSERVATIONS OF PRESSURE RECEIVED AT BRACKNELL ON THE GTS FOR EACH OF THE SIX-MONTH PERIODS COVERED BY THE WMO REPORTS ON THE QUALITY OF MARINE OBSERVATIONS.

Period	WMO report number	Number of Observations			
		Manual ships	Drifting buoys	Automatic ships	Total
Jan - Jun 1989	1	424087	174971	40082	639140
Jul - Dec 1989	2	421315	151972	58016	631303
Jan - Jun 1990	3	424335	177927	63847	666109
Jul - Dec 1990	4	412430	205488	71146	689064
Jan - Jun 1991	5	364760	177069	64401	606230
Jul - Dec 1991	6	348710	148604	68456	565770
Jan - Jun 1992	7	332443	216872	73893	623208
Jul - Dec 1992	8	336958	247873	80862	665693
Jan - Jun 1993	9	340293	288208	77317	705818
Jul - Dec 1993	10	348082	316261	88650	752993
Jan - Jun 1994	11	334134	279963	111928	726025
Jul - Dec 1994	12	383760	305618	142468	831846
Jan - Jun 1995	13	369781	407111	124537	901429
Jul - Dec 1995	14	394016	528938	138653	1061607
Jan - Jun 1996	15	430162	566035	122909	1119106
Jul - Dec 1996	16	477928	621869	133221	1233018
Jan - Jun 1997	17	446530	623835	122178	1192543
Jul - Dec 1997	18	453399	684292	140227	1277918
Jan - Jun 1998	19	426622	700743	423217	1550582
Jul - Dec 1998	20	443548	700239	497313	1641100
Jan - Jun 1999	21	432506	697983	466311	1596800

TABLE 3: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT PRESSURE OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 1999.

Column 1 Call sign or identifier.
Column 2 Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of pressure observations differing by more than 15 hPa from background (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Columns 6-9 Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, T=Tokyo, W=Washington.
Column 10 Comments on quality of pressure observations.

Notes: 1. Units are hPa.
2. Observing platforms marked with an asterisk were listed in the previous report (July to December 1998)

Table 3a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
14652		96	0	3.8	-3.9	0	0	0	0	Bias
25565		95	46	3.9	-9.1	1	1	0	1	Gross Errors & Bias
33538		220	45	6.0	-0.1	1	1	1	1	Standard Deviation
35538	*	42	14	0.9	0.8	1	1	0	1	Gross Errors
41633		222	7	5.2	-3.6	0	0	0	1	Standard Deviation & Bias
46660		45	0	1.8	-5.5	1	1	0	1	Bias
46913		117	103	2.9	11.4	2	2	0	2	Gross Errors & Bias
46929		125	6	3.9	-9.5	1	1	1	1	Bias
53903		623	15	5.4	-0.9	2	2	1	3	St'd Deviation from February
54934		683	65	5.3	-1.5	0	0	1	0	St'd Deviat'n, Bias from June
56547		59	12	4.3	5.5	1	1	0	1	Bias
62503		92	0	4.0	4.5	1	1	0	1	Bias
62517	*	446	5	2.2	2.5	0	0	0	0	Bias from April
62518	*	75	74	——	——	1	1	0	1	Gross Errors
64528		114	113	——	——	1	1	0	1	Gross Errors
64691		958	125	5.6	4.1	1	1	1	1	St'd Deviat'n, Bias from June
65592		3974	180	3.4	-0.8	2	2	1	2	St'd Deviation from April

*ii): Platforms **operational** at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	T	W	Comments
17513	1460	2	2.7	2.3	0	0	0	0	Bias drift; 3.5 hPa June
17904	1476	18	2.8	1.8	0	0	0	0	St'd Deviation from June
33502	806	5	2.6	-0.1	0	0	0	0	St'd Deviation from June
33946	1323	20	3.4	-0.8	0	0	0	0	St'd Deviation from June
34913	1642	1	2.4	1.5	0	1	1	1	Bias from June
34915	1542	12	3.1	2.0	1	2	2	2	Bias from May
56529	1301	3	2.0	-0.6	1	0	1	1	Bias from May
56608	1586	94	2.5	-0.8	1	0	1	1	GE & SD from June
71548	51	44	——	——	0	0	0	0	Gross Errors
71556	1529	4	3.3	1.1	0	0	0	0	St'd Deviation from June

Table 3b: Platforms reporting in SHIP code

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
AGRF		47	0	0.7	4.1	1	0	0	1	Bias
CYLX	*	43	25	5.8	-10.9	0	0	1	0	Gross Errors
C6CU6	*	89	2	3.5	-0.6	0	0	0	0	Standard Deviation from May
C6PE4		239	0	2.4	-1.4	1	0	0	0	Bias from May
C6PZ3		47	0	1.6	9.3	1	1	1	1	Bias
DHGE		43	18	1.3	-1.1	0	0	0	1	Gross Errors
DPBP		137	1	1.6	-3.1	1	0	1	0	Bias from March
ELKZ5		63	0	1.6	3.7	0	0	2	1	Bias
ELMQ		62	12	5.0	-2.8	0	0	2	0	Standard Deviation
ELRM4		48	0	5.3	-3.3	0	0	0	2	Standard Deviation
ELTE6		62	1	1.2	-4.7	1	3	4	3	Bias
ELUB5		274	4	5.0	3.2	3	3	3	3	Standard Deviation
ELVI2		271	0	1.3	-5.0	4	4	4	4	Bias
FHZI	*	60	0	2.0	-3.7	0	1	0	1	Bias
LAEP4		63	0	2.5	-4.1	0	0	0	0	Bias
LAFQ5		189	2	2.1	-2.4	1	1	0	1	Bias from April
LATI4		174	0	3.4	-2.1	3	1	1	0	Bias from May
LAXP4	*	157	0	2.4	-3.9	0	1	2	1	Bias
OXKT2		62	0	2.7	-3.9	0	0	0	0	Bias from March
OZBW6		322	0	1.3	-3.3	0	0	0	0	Bias from May
PCBU		64	0	2.7	9.6	1	1	1	1	Bias
PCCZ	*	107	0	2.4	5.0	2	3	2	1	Bias
PEXX	*	192	0	2.1	-4.3	3	2	4	5	Bias
PJKP		191	0	1.7	-3.5	1	0	0	0	Bias
P3YS5	*	386	0	1.5	4.1	4	5	4	3	Bias
S6JP		57	1	5.0	-2.6	0	0	0	0	Standard Deviation
TEST1		79	37	3.2	-2.4	1	0	0	1	Gross Errors
UAMQ		100	1	2.4	-3.3	1	1	1	0	Bias from May
UBCB		85	0	2.8	-3.9	0	1	3	1	Bias from April
UCAC		65	0	2.3	5.0	0	0	0	0	Bias

Continued →

Identifier	N Obs.	NGE	SD	Bias	B	E	T	W	Comments
UCJB	77	1	3.7	-1.4	1	1	0	1	Bias from June
UCJI	64	0	2.6	-5.2	1	1	1	1	Bias
UCJL	70	0	1.8	4.0	0	0	0	0	Bias
UCTQ	55	4	3.1	-3.5	0	0	0	0	Bias
UCUD	63	13	7.7	0.0	2	2	2	2	Standard Deviation
UCUF	47	5	3.9	6.1	2	1	2	2	Bias
UCUP	71	5	5.6	-2.7	2	1	1	2	SD, Bias from April
UDUE	101	27	1.7	12.5	4	3	2	4	Bias
UDYG	82	1	4.7	-2.0	1	1	0	1	Bias from May
UDYN	100	2	3.0	5.8	2	2	2	2	Bias
UFJJ *	219	3	2.1	-4.1	2	2	2	2	Bias
UFJU	110	110	——	——	2	4	1	4	Gross Errors
UFYN	79	2	3.7	-3.9	0	0	0	0	Bias
UHVW *	50	0	1.4	5.1	0	0	0	0	Bias
UICO *	105	0	2.8	3.2	1	0	1	1	Bias from June
UIKI *	57	0	1.4	4.2	1	1	1	1	Bias
VCJM *	46	46	——	——	0	0	0	0	Gross Errors
VCTX	53	14	48	-0.9	0	0	0	1	Gross Errors
VVGG	153	0	2.2	5.7	6	3	6	6	Bias
VYNG	82	70	1.3	1.6	2	0	0	2	Gross Errors
V2XO *	266	0	1.7	-3.3	0	0	0	1	Bias from June
V7BI3	64	0	8.2	-1.2	1	0	3	1	Standard Deviation & Bias
WAV4647	44	0	5.3	-1.0	0	0	0	1	Standard Deviation
WDZB *	224	0	1.1	-5.9	5	5	5	5	Bias
WDZG *	157	1	2.0	-4.4	2	2	3	2	Bias
ZCAM9	294	2	3.6	7.7	6	6	6	5	Bias
ZSDN	218	0	2.0	3.9	3	3	3	3	Bias from March
3ECI8	228	0	1.3	-5.0	4	3	3	4	Bias
3FFG7	70	0	1.2	-4.0	3	3	0	0	Bias
3FGN3 *	78	1	1.4	-7.6	1	3	4	2	Bias
3FGQ3 *	295	0	1.2	8.9	6	6	6	6	Bias
3FPB6 *	69	0	2.1	-4.6	1	2	0	2	Bias
31497 *	68	68	——	——	1	1	0	0	Gross Errors
48102	2414	876	1.3	0.1	5	5	4	5	Gross Errors
48111	1305	612	1.2	-0.1	2	2	2	2	Gross Errors
62026	1387	229	2.5	0.3	1	1	1	1	Gross Errors from June
62138	502	4	3.5	2.1	2	2	2	2	Bias from May
62142	3569	93	1.1	3.5	1	1	1	1	Bias

TABLE 4: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 3 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 1998.

Column 1 Call sign or identifier.
Column 2 Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of pressure observations differing by more than 15 hPa from background (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6 Comments on quality of pressure observations.

Notes: 1. Units are hPa.

Identifier	N Obs.	NGE	SD	Bias	Comments
CTHI	89	44	4.0	-2.6	Fewer Gross Errors from May
C6KF8	684	0	2.0	1.3	Bias reduced
DUWH	0				No reports
ELRT5	0				No reports
ELTE8	13	0	2.5	-3.0	Less than 40 reports
ELTP9	0				No reports
ELTX5	25	0	2.0	6.0	Less than 40 reports
FZOP	87	0	1.5	-0.3	Standard Deviation reduced
LAWR2	80	0	1.4	2.9	Bias reduced
OVLP	0				No reports
PCEX	17	1	2.9	8.0	Less then 40 reports
PFSK	162	0	1.9	-1.5	Bias reduced from February
UCJM	92	9	1.4	-0.4	Fewer Gross Errors
UCMR	83	7	4.0	-0.6	Fewer Gross Errors
UDTH	50	0	3.0	-3.2	Bias reduced
UDVB	37	8	5.6	-2.5	Less than 40 reports
UHRT	93	2	1.7	-0.3	Standard Deviation reduced
UIAG	105	13	4.4	-6.0	Bias reduced from June
UITJ	69	9	4.1	0	Bias reduced from March
UYPO	0				No reports
VCTV	71	1	2.7	2.7	Gross Errors and Standard Deviation reduced
VGDT	4	0	0.6	-6.7	Less than 40 reports
VGJC	24	12	7.8	-1.1	Less than 40 reports
VGKM	21	0	2.0	-0.2	Less than 40 reports
VRUS7	0				No reports

Continued →

Identifier	N Obs.	NGE	SD	Bias	Comments
VVRVI2	4	0	0.2	2.5	Less than 40 reports
VVKJ	10	0	2.4	-2.0	Less than 40 reports
WCV7620	37	0	1.7	6.2	Less than 40 reports
WQZ9670	389	1	3.5	-3.1	Bias reduced in May
3FKZ3	29	0	1.6	-3.1	Less than 40 reports
3KOW4	18	0	1.3	4.7	Less than 40 reports
9MCM	310	0	2.4	2.4	Bias reduced in April
9VPK	10	5	3.1	6.6	Less than 40 reports

TABLE 5: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT WIND SPEED OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 1999.

Column 1 Call sign or identifier.
Column 2 Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of wind observations with vector difference from background of more than 25ms $^{-1}$ (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Columns 6-9 Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, T=Tokyo, W=Washington.
Column 10 Comments on quality of wind speed observations.

Notes: 1. Units are ms^{-1} .
2. Observing platforms marked with an asterisk were listed in the previous report (January to June 1998)

Table 5a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	T	W	Comments
21531 *	1169	1	3.1	-6.6	4	2	5	5	Bias
41522	107	36	6.9	9.8	1	1	0	1	Standard Deviation & Bias
41599	129	55	6.1	15.9	1	1	0	1	Standard Deviation & Bias
46632	3142	11	3.3	-3.9	1	0	1	1	Bias drift; -5.8 ms^{-1} May

*ii): Platforms **operational** at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	B	E	T	W	Comments
15540	1170	0	4.0	-3.2	1	0	0	1	Bias drift; -5.0 ms^{-1} June

Table 5b: Platforms reporting in SHIP code

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
C6IF		66	0	3.8	7.8	1	1	0	1	Bias
C6LQ3	*	159	8	6.6	7.3	4	3	2	3	Standard Deviation & Bias
C6PT3		79	2	7.7	6.6	0	2	1	1	Standard Deviation & Bias
DGSE		300	2	4.1	3.0	1	1	1	0	Bias drift; 5.7 ms^{-1} June
DGUC		151	4	6.5	3.5	1	1	1	1	Standard Deviation
DUQM		223	18	4.7	6.8	4	2	5	4	Bias
DUXW		196	0	4.1	5.2	3	0	4	2	Bias
ELVG7		65	1	7.1	7.0	2	1	0	1	Standard Deviation & Bias
ELWC6		118	16	5.5	14.9	2	3	0	1	Bias
EQUV		44	0	4.7	5.5	0	0	0	0	Bias
LOWO2		111	0	4.8	3.5	1	1	0	1	Bias from June
MWBJ9		116	1	5.7	6.3	2	2	2	1	Bias
MXHR6		53	0	6.3	7.1	2	1	1	1	Standard Deviation & Bias
MXSD6		62	0	6.6	4.6	1	1	0	0	Standard Deviation
PGDC		212	3	6.3	4.2	3	2	2	2	SD, Bias from March
PGGQ		45	0	6.0	4.6	0	0	0	0	Standard Deviation
PJAG		231	0	6.5	6.2	2	4	3	3	Standard Deviation & Bias
PJOX	*	146	8	6.6	4.4	2	3	1	1	Standard Deviation
P3KZ7		84	0	5.7	7.9	2	2	1	2	Bias
P3XH7		62	0	6.4	5.7	1	0	0	0	Standard Deviation
SKFQ		97	4	6.9	-1.8	0	0	0	0	Standard Deviation
SYMK		260	1	2.4	5.5	4	2	1	1	Bias
UCUD		66	0	6.8	3.2	0	2	1	0	Standard Deviation
UCUF		50	0	6.0	4.6	1	1	1	1	Standard Deviation
ULYS		68	0	3.3	5.1	0	0	0	0	Bias
VRUZ7		106	5	5.6	9.2	5	5	0	5	Bias
VRVD6		183	0	4.4	3.5	1	1	0	1	Bias from May
V2TE		152	1	6.7	3.7	3	3	2	2	Standard Deviation
ZCAX9		87	1	6.7	3.6	0	0	0	0	Standard Deviation
62202		137	0	6.9	1.8	0	0	0	0	Standard Deviation
9MBQ4	*	77	0	4.6	6.6	2	2	0	2	Bias
9VMY	*	104	1	5.7	5.0	0	0	3	1	St'd Deviat'n & Bias
9VWH		180	85	11.0	2.2	2	2	3	3	GEs & Standard Deviation

TABLE 6: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 5 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 1998.

Column 1 Call sign or identifier.
Column 2 Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of wind observations with vector difference from background of more than 25ms^{-1} (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6 Comments on quality of wind speed observations.

Notes: 1. Units are ms^{-1}.

Identifier	N Obs.	NGE	SD	Bias	Comments
A9DG	28	0	5.7	6.0	Less than 40 reports
C6KE3	129	1	4.7	3.7	Fewer gross errors and reduced Bias from April
C6NI3	177	1	4.1	3.4	Bias reduced from February
DATG	67	0	2.1	0.8	Bias reduced
DGOL	143	0	3.9	3.1	Bias and Standard Deviation reduced
DHHO	134	7	4.5	2.7	Standard deviation reduced
DPRH	4	0	1.4	9.0	Less than 40 reports
DZFF	0				No reports
ELGG3	62	1	5.8	3.5	Bias reduced from May
ELJH9	94	0	2.8	2.7	Bias reduced
ELNK8	20	0	3.9	6.9	Less than 40 reports
FNRV	11	0	3.2	4.6	Less than 40 reports
GFWX	0				No reports
OUEK	0				No reports
OYCZ	35	4	8.6	13.0	Less than 40 reports
PCCZ	130	1	5.2	2.8	Bias and Standard Deviation reduced
PDTW	90	0	3.0	0.8	Standard Deviation reduced
PJED	208	0	5.8	3.9	Standard Deviation reduced
PJMJ	60	0	4.4	1.6	Standard Deviation reduced
S6DH	91	0	2.7	3.2	Bias reduced
3FDO6	35	0	2.5	1.7	Less than 40 reports
63113	2953	0	1.9	-0.1	Standard deviation reduced
64045	2668	3	3.6	-2.8	Bias reduced
9KKF	116	0	4.1	3.1	Bias reduced
9MBK	95	0	2.5	2.0	Bias reduced
9MBK8	64	0	5.1	3.5	Bias reduced from February
9MUG	234	11	5.4	7.4	Bias and Standard Deviation reduced from May
9VVU	86	0	3.9	-4.9	Bias reduced

TABLE 7: LIST OF MARINE OBSERVING PLATFORMS PRODUCING SUSPECT WIND DIRECTION OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 1999.

Column 1 Call sign or identifier.
Column 2 Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of wind observations with vector difference from background of more than 25ms^{-1} (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Columns 6-9 Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, T=Tokyo, W=Washington.
Column 10 Comments on quality of wind direction observations.

Notes:
1. Units are degrees (°).
2. Observing platforms marked § had a significant bias at some time within the period and the statistics and their plots refer to direction reports associated with background wind speeds greater than 5 ms^{-1}. If no significant speed bias was present, the statistics and plots refer to direction reports with an observed speed greater than 5 ms^{-1}.
3. Observing platforms marked with an asterisk were listed in the previous report (January to June 1998)

Table 7a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
21531	*§	903	1	23.2	-30.6	1	3	0	2	Bias
44602		77	1	29.8	78.1	1	1	0	1	Bias
46632	§	2655	11	64.5	7.6	2	0	1	0	Erratic

*ii): Platforms **operational** at the end of the reporting period*

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
55587	*	4277	0	31.7	44.6	6	5	6	4	Bias

Table 7b: Platforms reporting in SHIP code

Identifier		N Obs.	NGE	SD	Bias	B	E	T	W	Comments
ELVH7		233	2	64.2	-4.5	1	0	0	0	Standard Deviation
KHLN		73	0	63.8	4.7	0	0	0	2	Standard Deviation
PFDI		103	0	103.1	46.2	1	2	2	2	Erratic
SMLQ		208	1	74.4	0.1	0	2	1	3	Standard Deviation
UBCB		84	3	28.1	68.2	1	2	5	4	Bias
9VWH	§	167	85	98.9	11.0	2	3	2	3	Erratic

TABLE 8: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 7 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 1998.

Column 1 Call sign or identifier.
Column 2 Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors.
Column 3 Number of wind observations with vector difference from background of more than 25ms $^{-1}$ (gross error).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences (bias) excluding cases of gross error.
Column 6 Comments on quality of wind direction observations.

Notes: 1. Units are degrees (°).

Identifier	N Obs.	NGE	SD	Bias	Comments
ELTQ5	22	0	29.3	-4.3	Less than 40 reports
GBSA	60	1	59.6	-0.6	Bias stable
GVSN	108	1	27.9	-9.7	Bias stable
LAKW2	0				No reports
UCMR	39	2	61.8	23.9	Less than 40 reports
3FFF8	23	0	25.9	-2.6	Less than 40 reports
46053	97	0	19.5	-37.6	Bias reduced in most recent reports

TABLE 9: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT SEA-SURFACE TEMPERATURE OBSERVATIONS OVER THE JANUARY TO JUNE 1999.

Column 1 Call sign or identifier
Column 2 Number of sea-surface temperature observations available for monitoring during June 1999 (or May and June if suspect only by considering the two month period), including any observations with gross errors.
Column 3 Number of sea surface temperature observations differing by more than 15 °C from the NCEP background field (gross errors).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences excluding cases of gross error.
Column 6 Comments on quality of sea surface temperature observations.

Notes: 1. Units are °C.
2. Observing platforms marked with an asterisk were listed in the previous report (July to December 1998)

Table 9a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

The information available from NCEP did not allow statistics to be assessed for platforms in this category.

*ii): Platforms **operational** at the end of the reporting period*

Identifier	N Obs.	NGE	SD	Bias	Comments
14540	71	0	4.1	-5.5	Bias
15538 *	94	0	0.4	-4.6	Bias
21607	219	1	1.6	4.1	Bias
23504	266	61	8.3	-0.9	Standard Deviation
41921	68	0	0.8	-10.7	Bias
44507	221	0	1.6	7.9	Bias
44765	115	111	3.5	-8.5	Gross Errors
44840	315	0	2.9	4.3	Bias
46736	82	0	1.2	6.2	Bias
51825	73	35	0.3	-0.2	Gross Errors
54859	85	0	0.2	-4.6	Bias
61525	168	0	0.9	5.8	Bias
61527	186	0	0.8	5.6	Bias
61528	102	1	0.9	5.7	Bias
65592	105	0	1.9	-5.4	Bias

Table 9b: Platforms reporting in SHIP code

Identifier		N Obs.	NGE	SD	Bias	Comments
FARIS		43	0	1.1	-4.6	Bias
JADY		56	0	0.7	4.4	Bias
KIOH		69	0	1.1	-4.2	Bias
KLKZ	*	53	0	2.7	7.7	Bias
LPOI1	*	675	24	6.4	0.5	Standard Deviation
OUEX		53	1	1.7	-4.7	Bias
SALA		49	0	1.9	-6.9	Bias
SYMK		46	5	4.8	-7.9	Bias
UBCB		77	0	1.1	-4.9	Bias
UCKZ		91	46	3.8	6.9	Gross Errors and Bias
UCOR		96	1	4.3	-4.2	Bias
WE4879		42	1	3.8	4.3	Bias
YJZC5	*	71	0	1.3	-5.5	Bias
3ECM7		47	0	1.6	4.2	Bias
45138		147	0	2.5	5.2	Bias
45140		644	24	6.3	-1.6	Standard Deviation
45154		348	0	1.8	4.3	Bias
46013		681	0	2.9	-4.8	Bias
46026		693	0	3.7	-4.5	Bias
46131	*	712	0	1.1	-4.6	Bias

TABLE 10: PLATFORMS LISTED AS SUSPECT, BY NCEP, IN JUNE 1999 FOR WHICH THERE IS INSUFFICIENT INFORMATION TO JUDGE OBSERVATION QUALITY OVER A LONGER PERIOD.

Column 1 Call sign or identifier
Column 2 Number of sea-surface temperature observations available for monitoring during June 1999, including any observations with gross errors.
Column 3 Number of sea surface temperature observations differing by more than 15 °C from the NCEP background field (gross errors).
Column 4 Standard deviation of observation-minus-background differences excluding cases of gross error.
Column 5 Mean of observation-minus-background differences excluding cases of gross error.
Column 6 Comments on quality of sea surface temperature observations.

Notes: 1. Units are °C.
2. Observing platforms marked with an asterisk were listed in the previous report (July to December 1998)

Table 10a: Platforms reporting in BUOY code

Identifier	N Obs.	NGE	SD	Bias	Comments
32821	20	0	3.1	9.0	Bias

Table 10b: Platforms reporting in SHIP code

Identifier	N Obs.	NGE	SD	Bias	Comments
CFI9556	29	0	2.6	-4.9	Bias
DCEH	39	0	1.0	-5.3	Bias
ELVH6	33	1	2.3	-4.6	Bias
ELWC6	26	0	3.0	4.5	Bias
PHPK	33	0	1.7	-4.3	Bias
WXQ4511	33	0	3.4	4.5	Bias
3FIC5	38	3	2.9	-7.1	Bias
9KKS	22	0	0.6	-5.2	Bias

Figure 1: Number of observations of pressure received at Bracknell on the GTS for each of the six-month periods covered by the WMO reports on the quality of marine surface observations

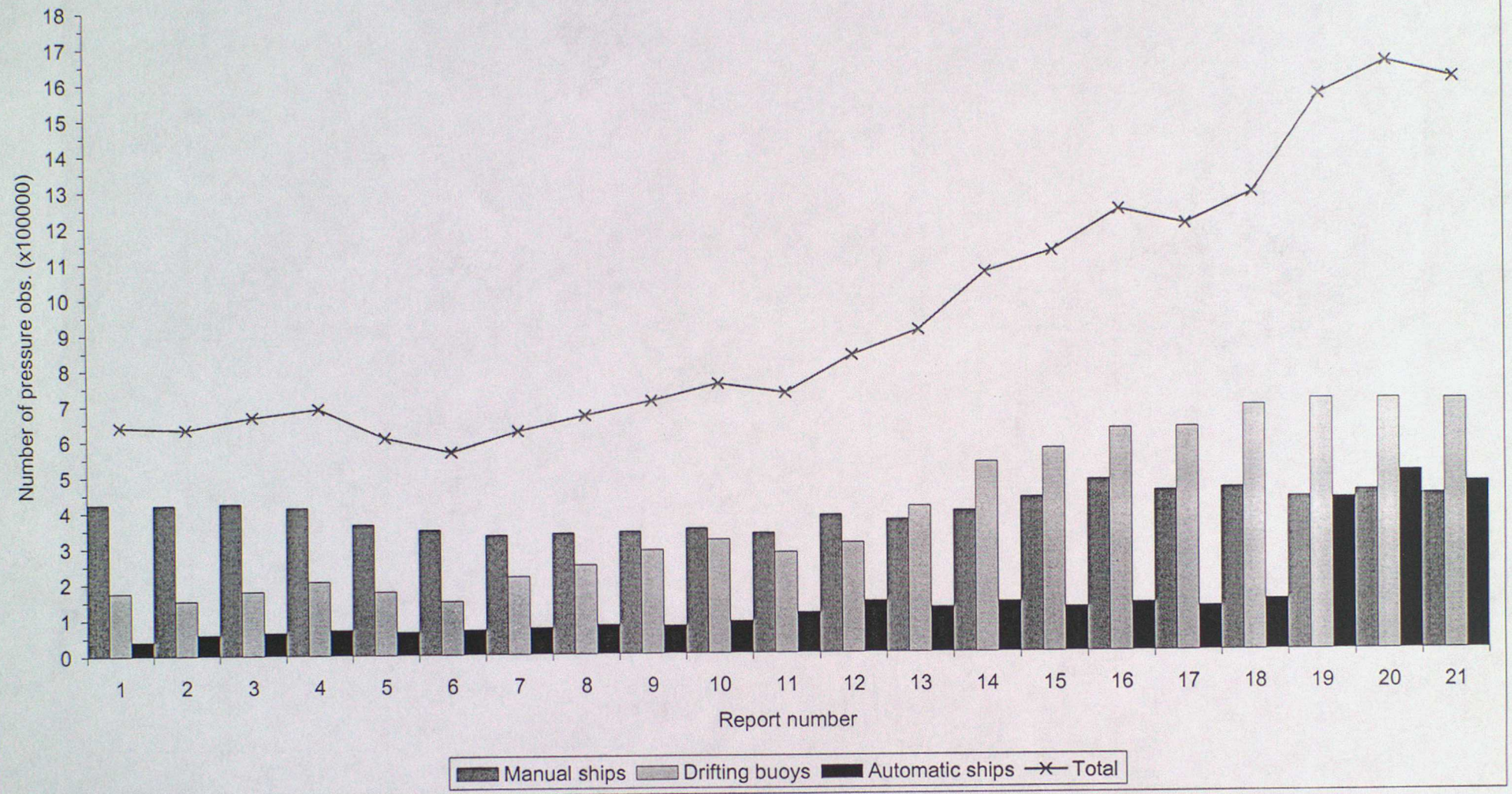
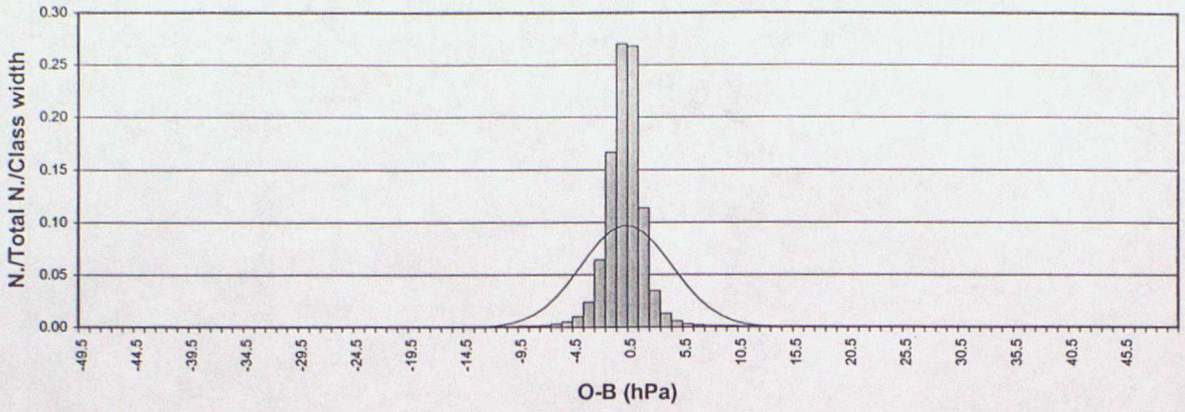
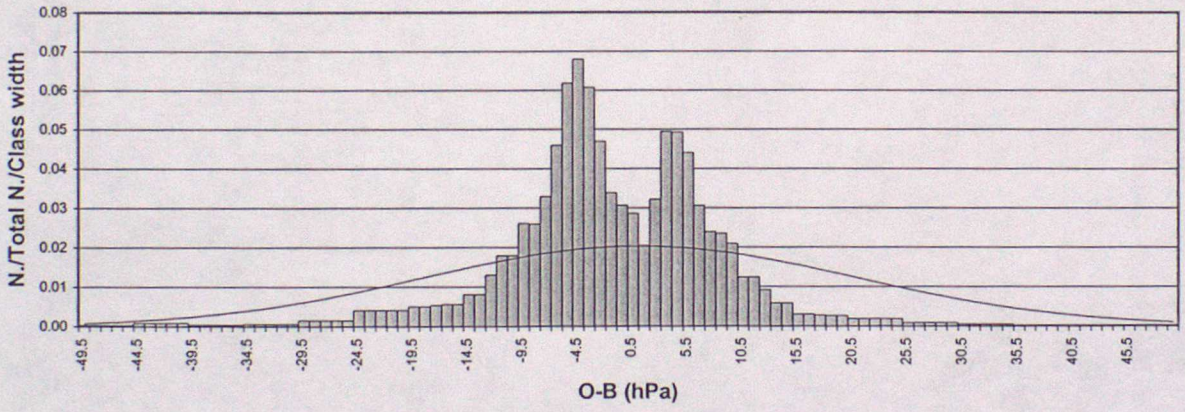


Figure 2a: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 1999 Data used: All observations



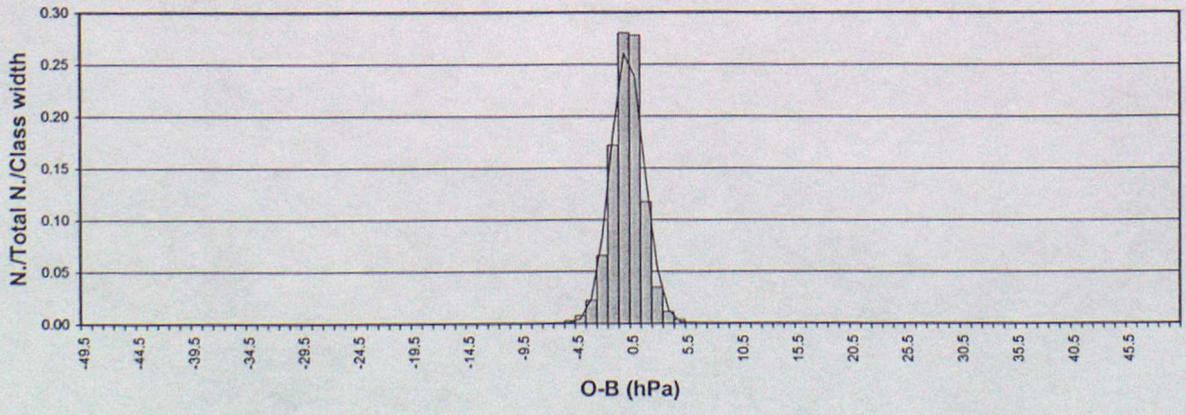
Mean O-B = -0.1 SD O-B = 4.1

Figure 2b: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 1999 Data used: Flagged observations



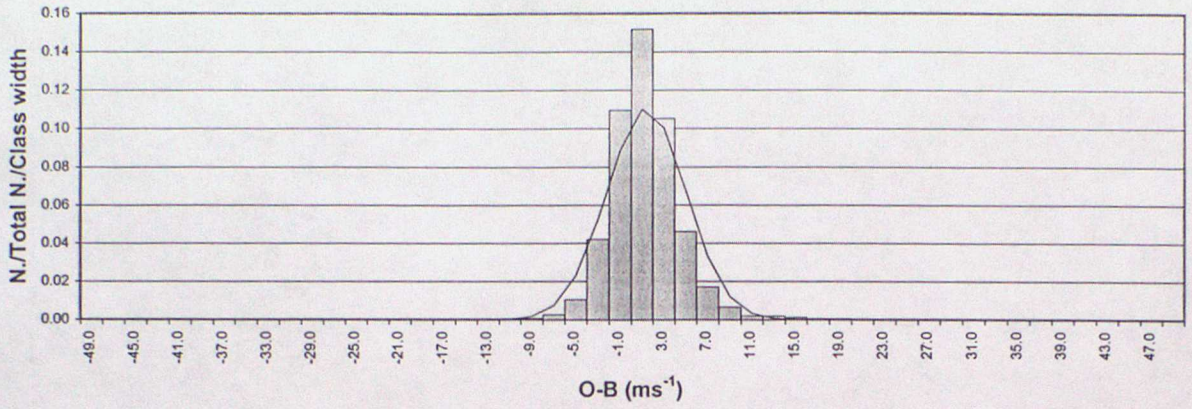
Mean O-B = 1 SD O-B = 19.7

Figure 2c: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 1999 Data used: Unflagged observations



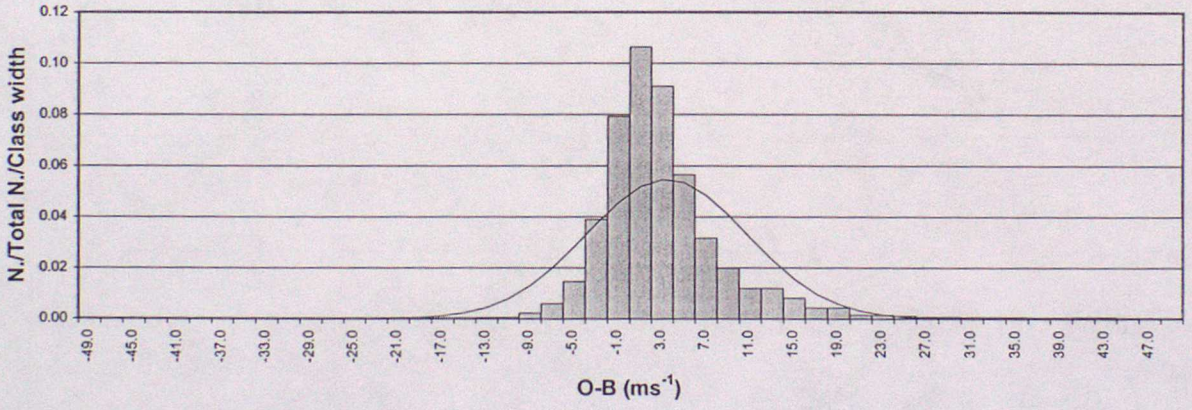
Mean O-B = -0.2 SD O-B = 1.5

Figure 2d: Distribution of ship O-B wind speed (ms^{-1})
Period of data: Jan-June 1999 Data used: All observations



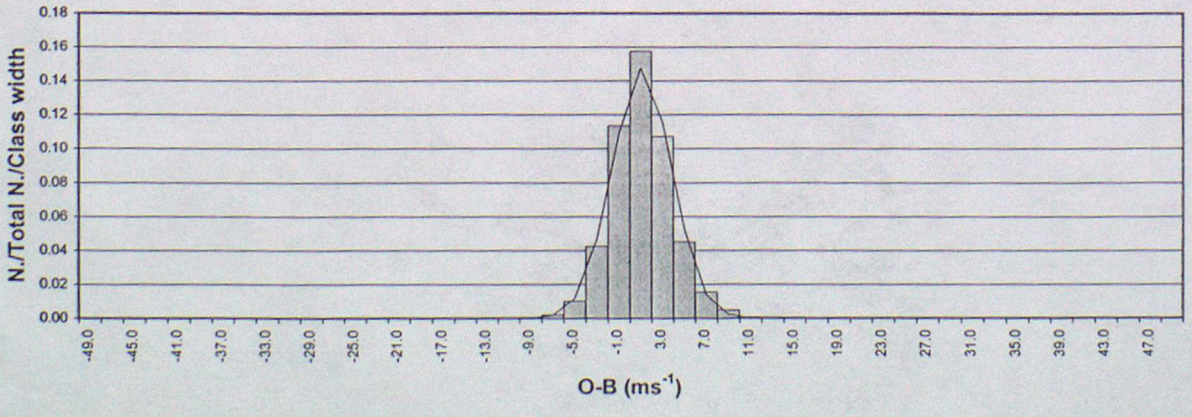
Mean O-B = 1.4 SD O-B = 3.6

Figure 2e: Distribution of ship O-B wind speed (ms^{-1})
Period of data: Jan-June 1999 Data used: Flagged observations



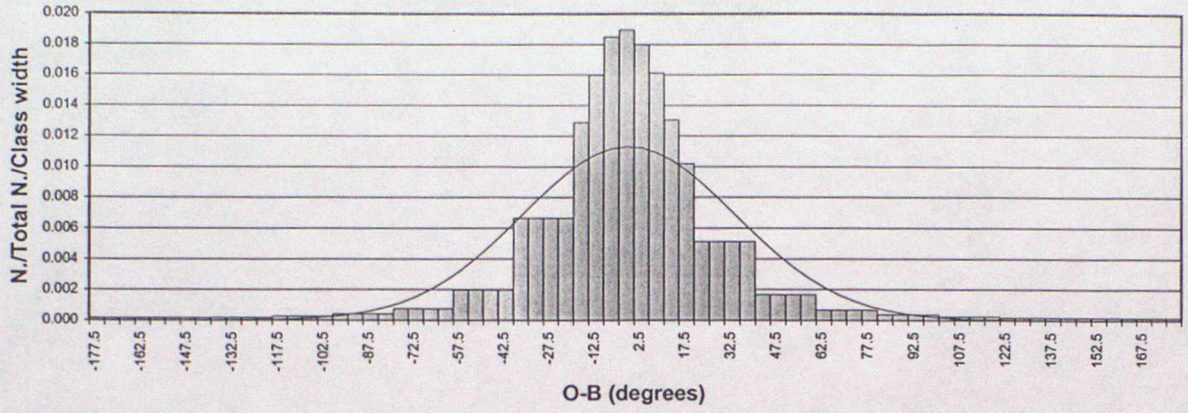
Mean O-B = 3.4 SD O-B = 7.3

Figure 2f: Distribution of ship O-B wind speed (ms^{-1})
Period of data: Jan-June 1999 Data used: Unflagged observations



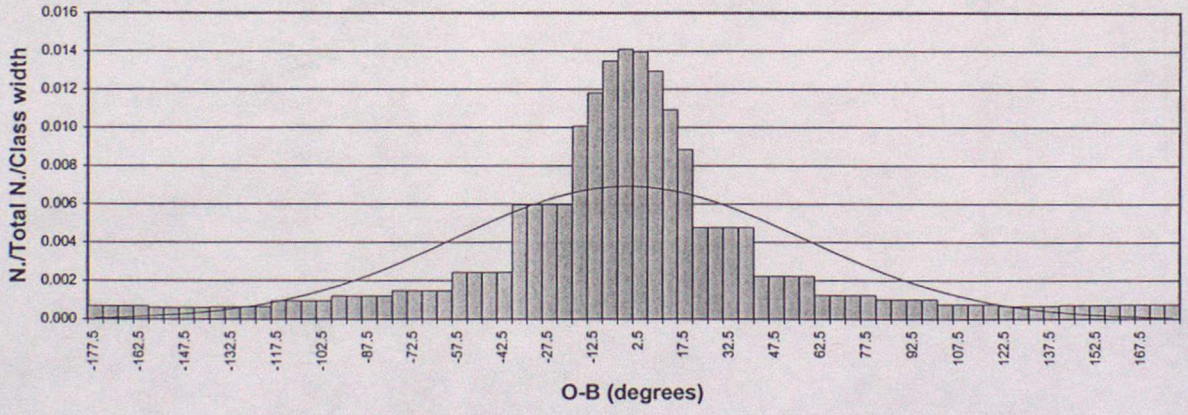
Mean O-B = 1.1 SD O-B = 2.7

Figure 2g: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 1999 Data used: All observations



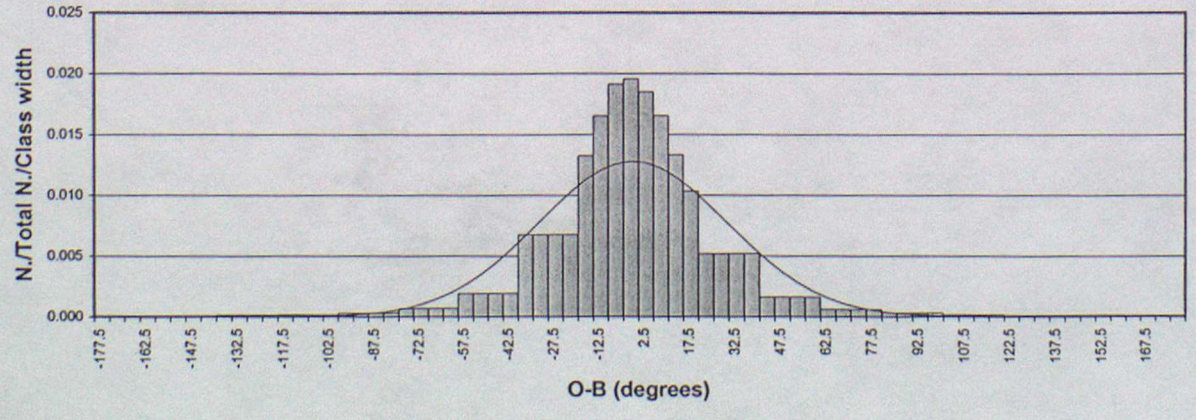
Mean O-B = -1.8 SD O-B = 35.3

Figure 2h: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 1999 Data used: Flagged observations



Mean O-B = -1.5 SD O-B = 57.7

Figure 2i: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 1999 Data used: Unflagged observations



Mean O-B = -1.9 SD O-B = 31.2

FIG 3: BIAS OF SHIP PRESSURE O-B. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE BIAS OF MAGNITUDE GREATER THAN 0.5 HPA

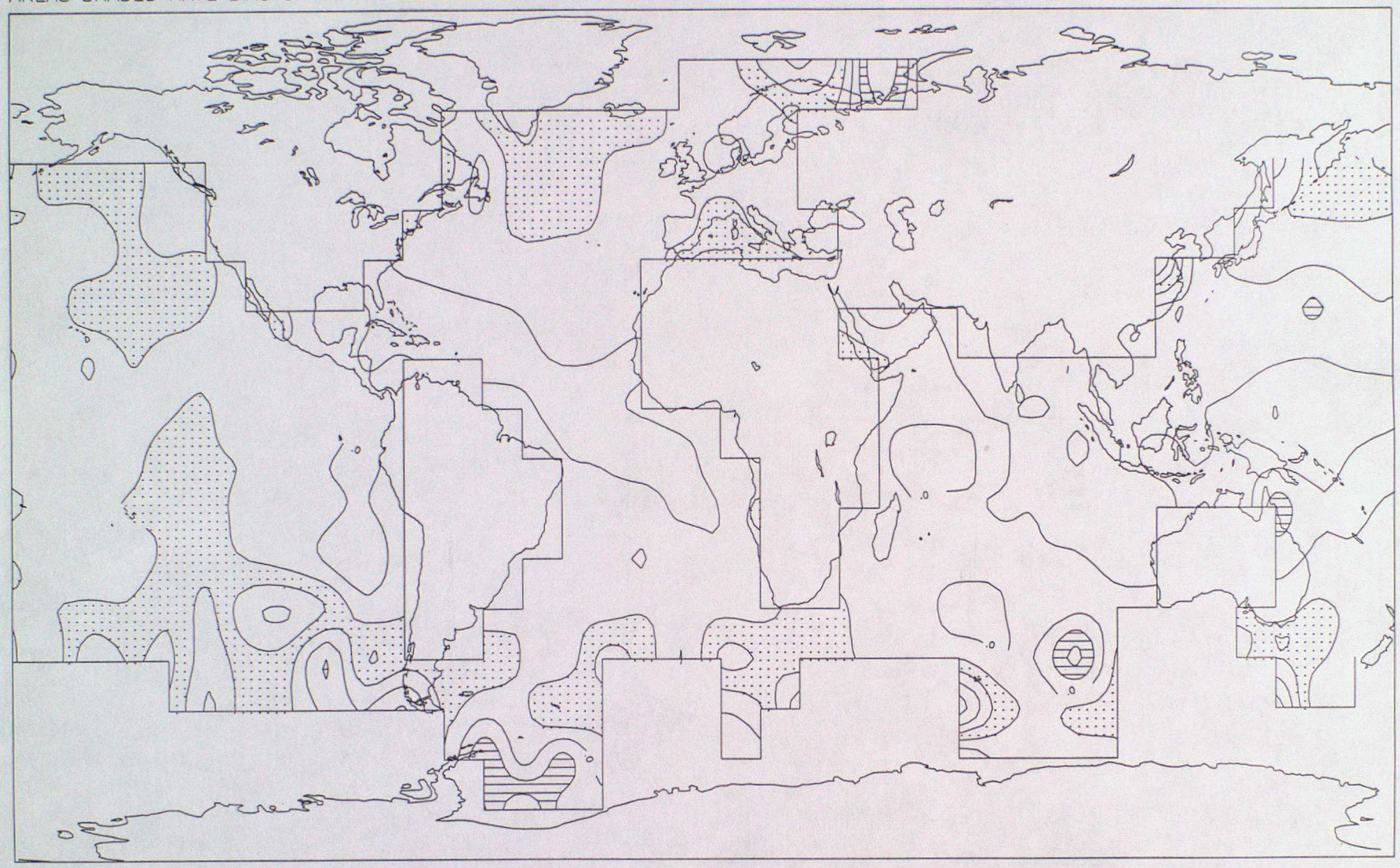


FIG 4: S.D. OF SHIP PRESSURE O-B. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE STANDARD DEVIATION GREATER THAN 2.0HPA

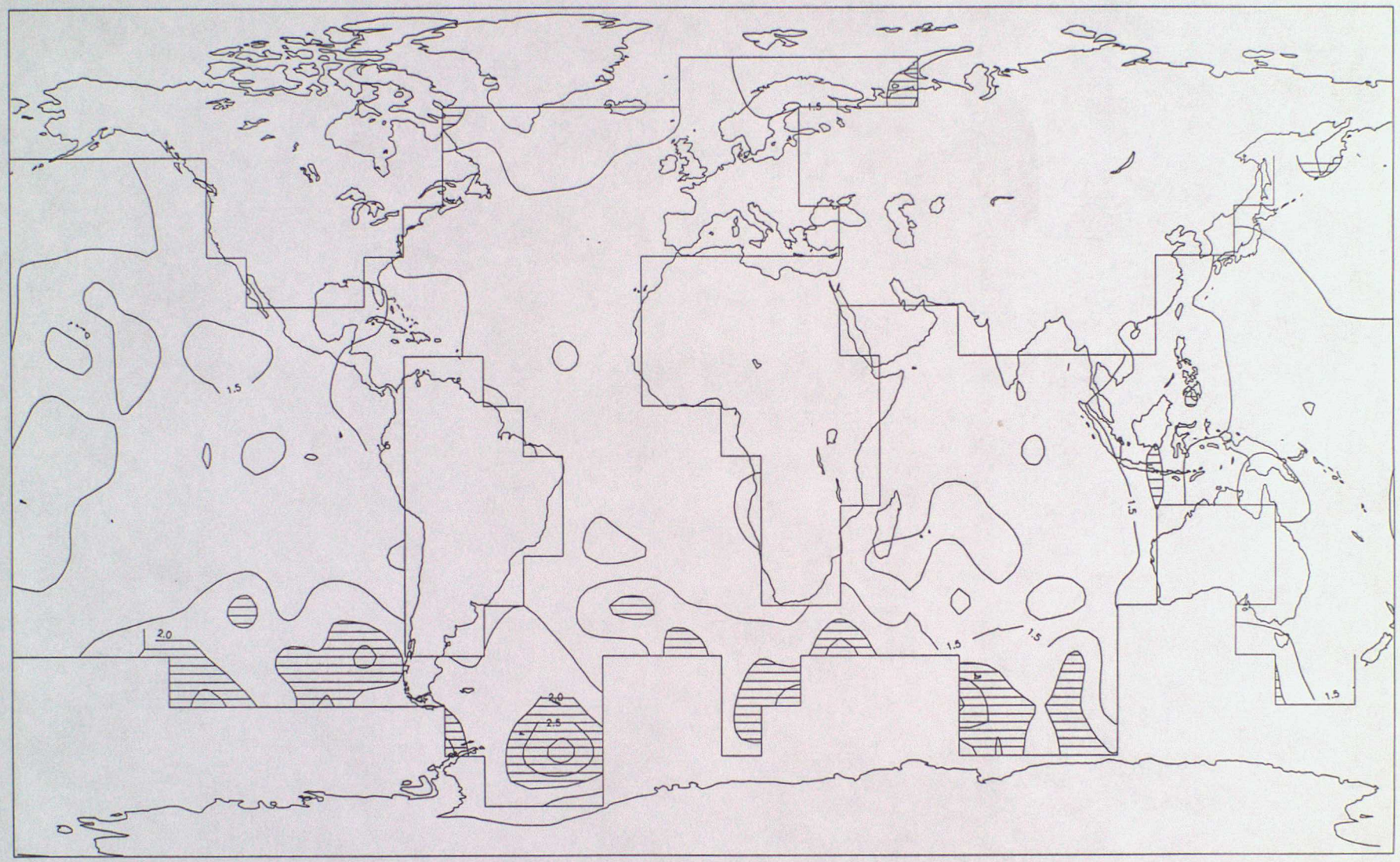


FIG 5:
PLOT OF NUMBER OF SHIP PRESSURE OBS. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL INCLUDED

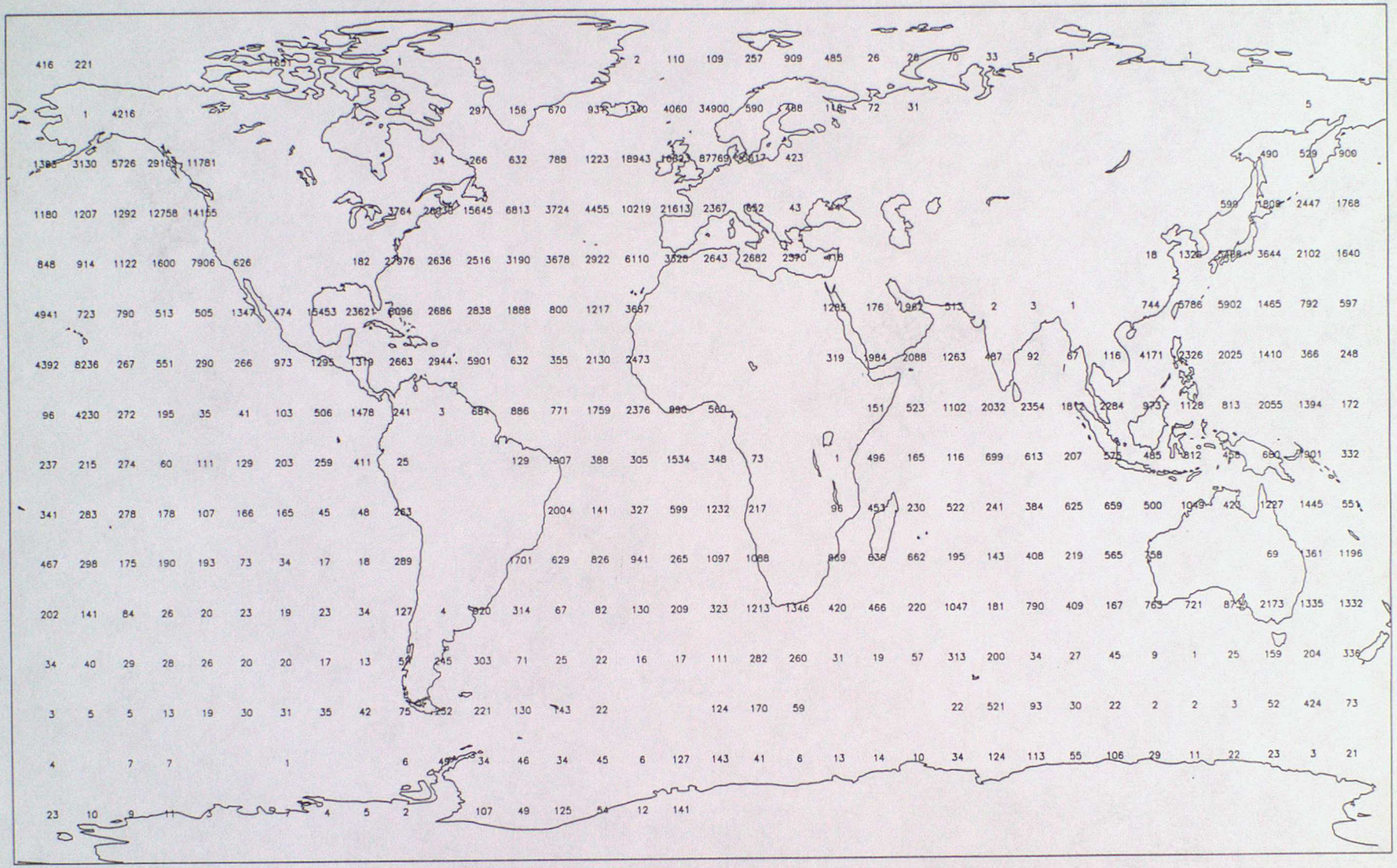


FIG 6: BIAS OF SHIP O-B WIND SPEED IN MS-1. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE BIAS OF MAGNITUDE GREATER THAN 2.0MS-1

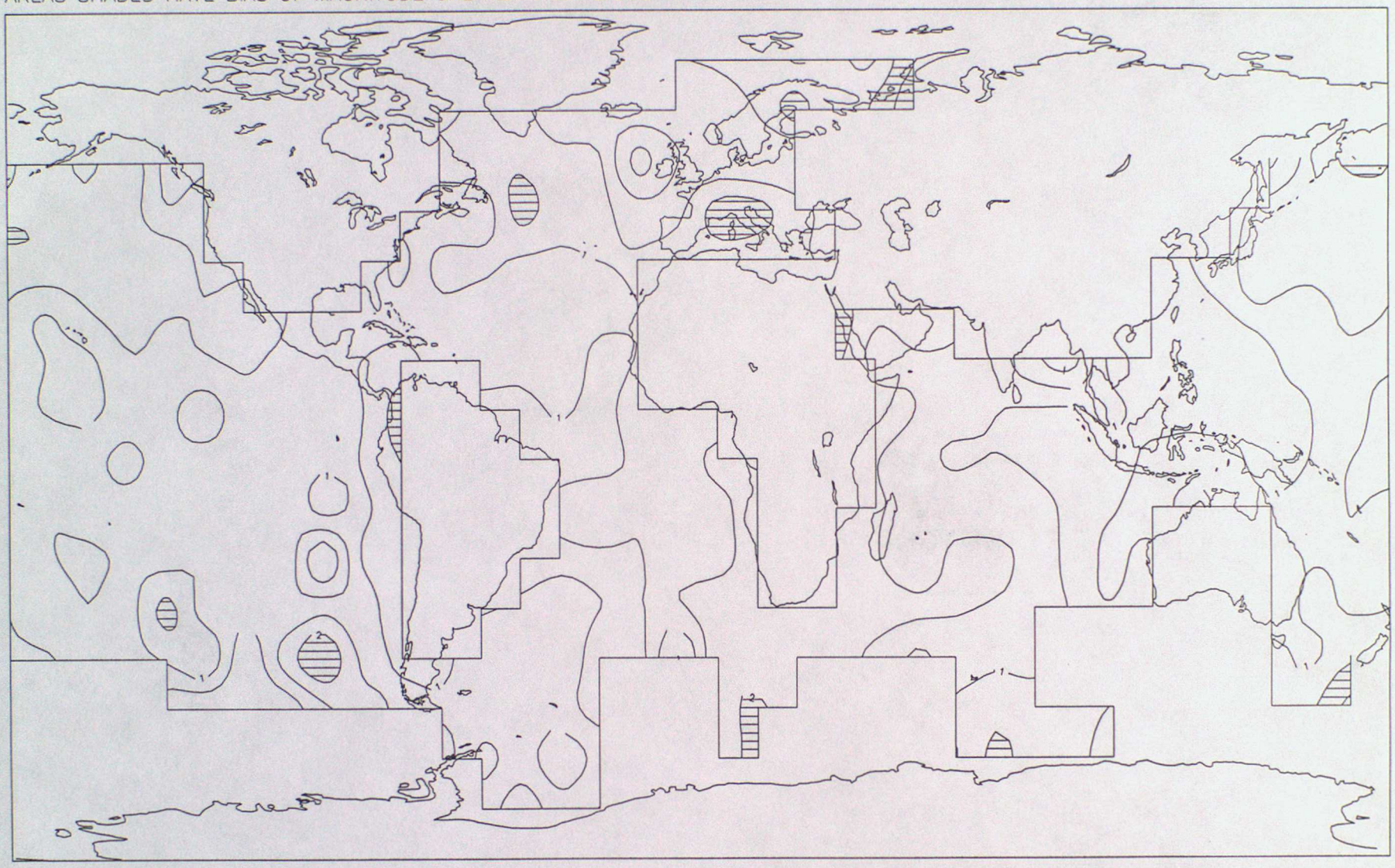


FIG 7: S.D. OF SHIP O-B WIND SPEED IN MS-1. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE STANDARD DEVIATION GREATER THAN 4.0 MS-1

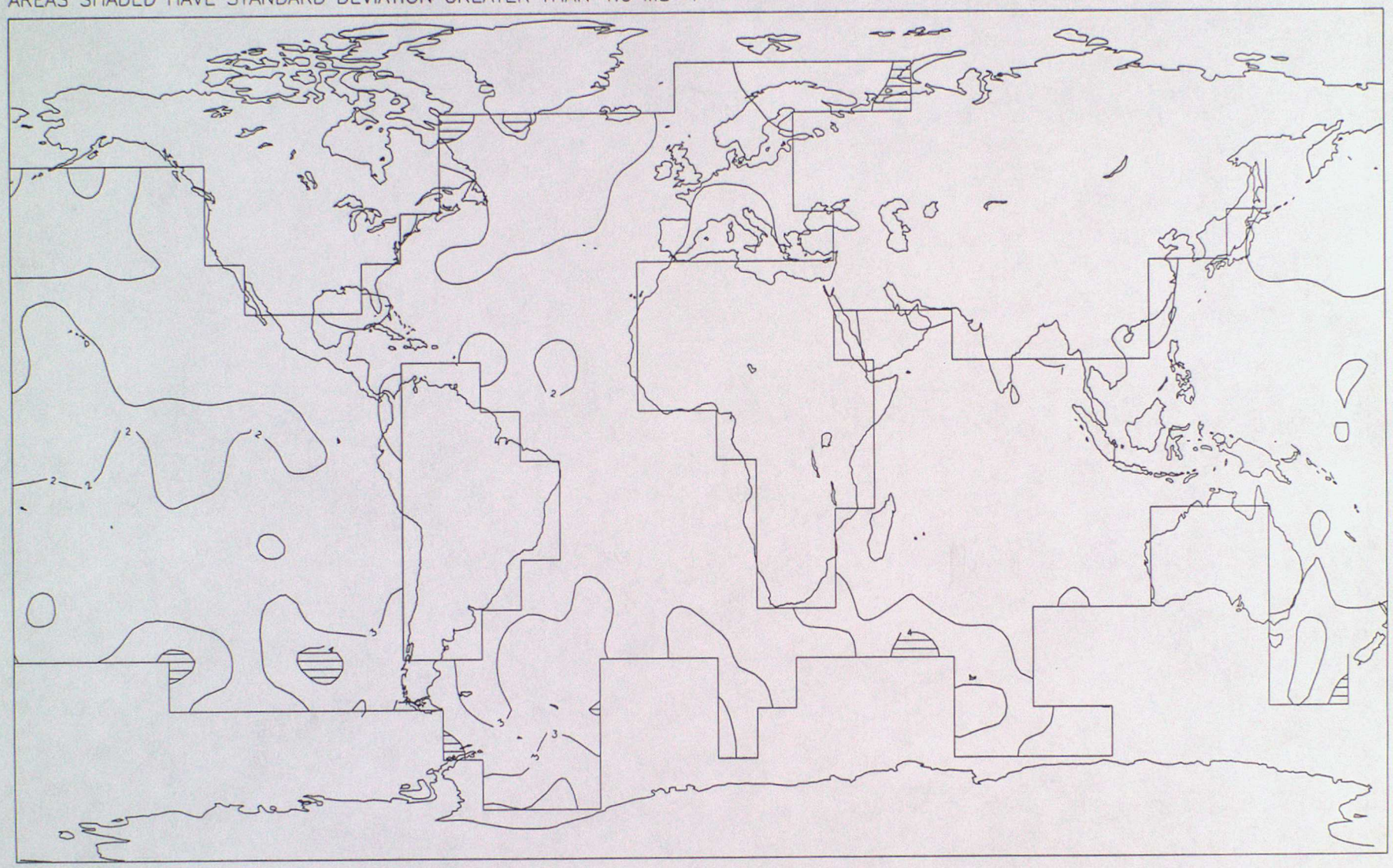


FIG 8:
PLOT OF NUMBER OF SHIP WIND SPEED OBS. DATE:- JANUARY – JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL INCLUDED

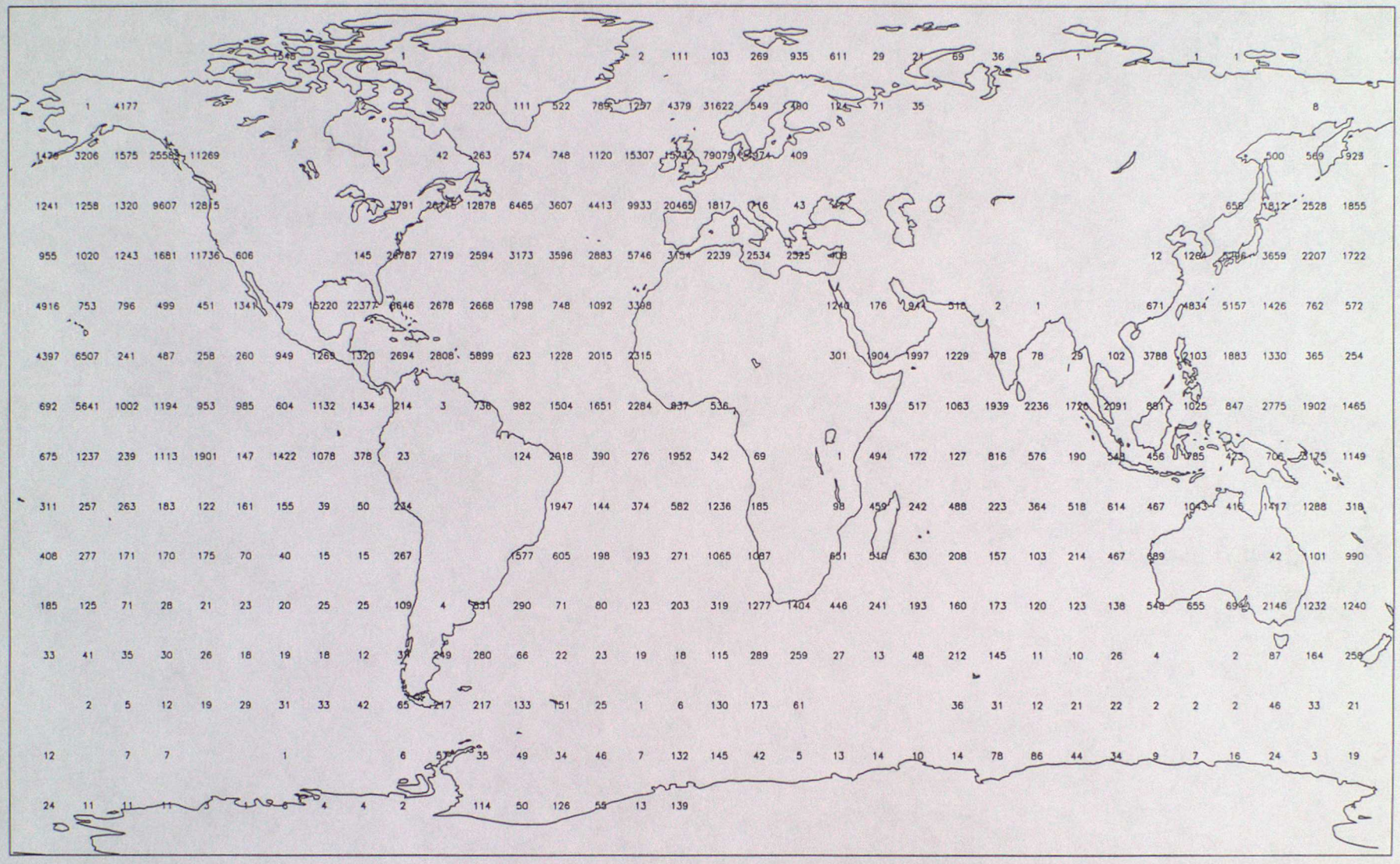


FIG 9: BIAS OF SHIP O-B WIND DIRECTION IN DEG. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE BIAS OF MAGNITUDE GREATER THAN 10 DEG

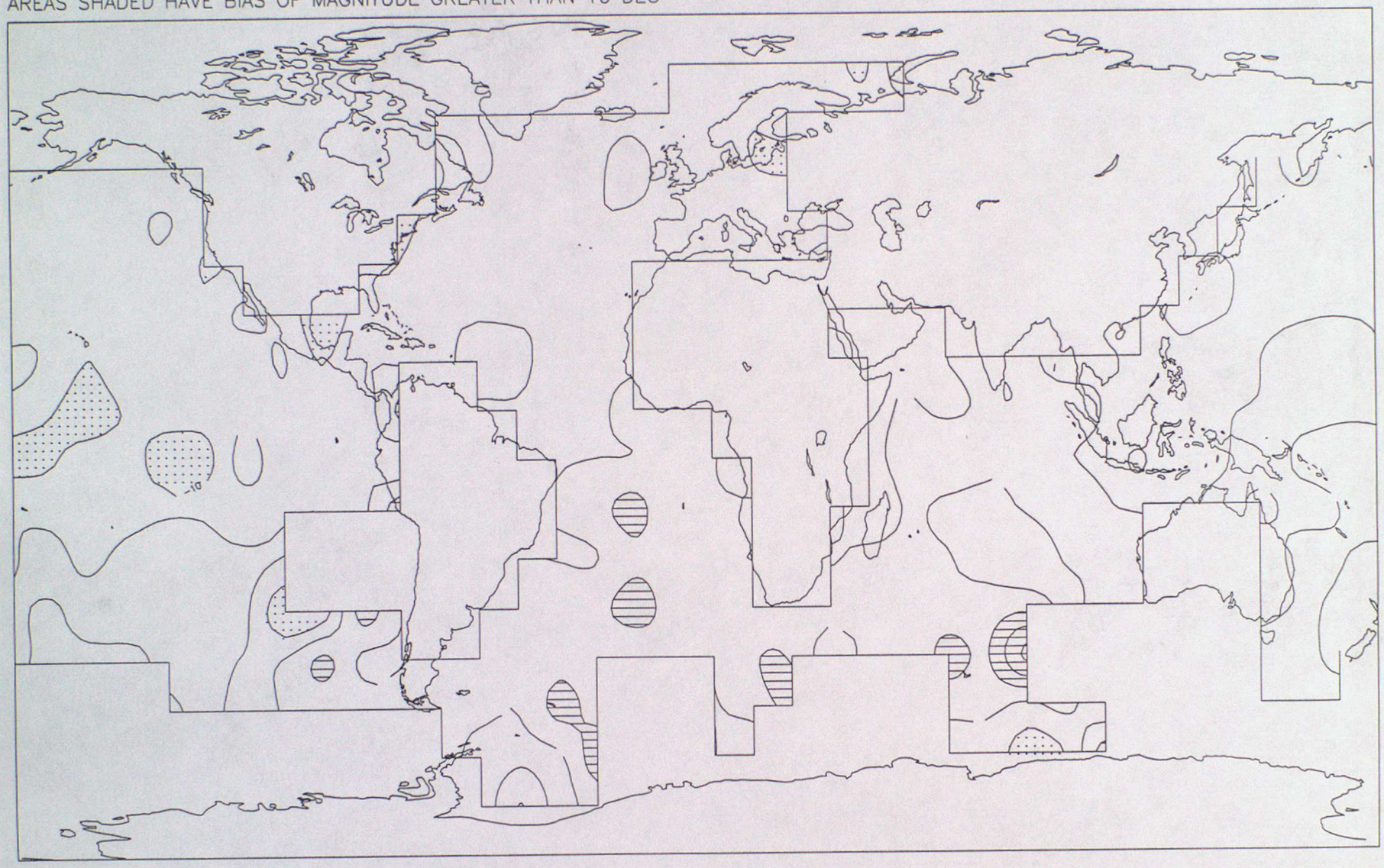


FIG 10: S.D. OF SHIP O−B WIND DIRECTION IN DEG. DATE:− JANUARY − JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL USED IN STATISTICS
CONTOURS DRAWN TO 10 DEGREE BOXES IF N. OF OBS > 10
AREAS SHADED HAVE STANDARD DEVIATION GREATER THAN 40 DEG

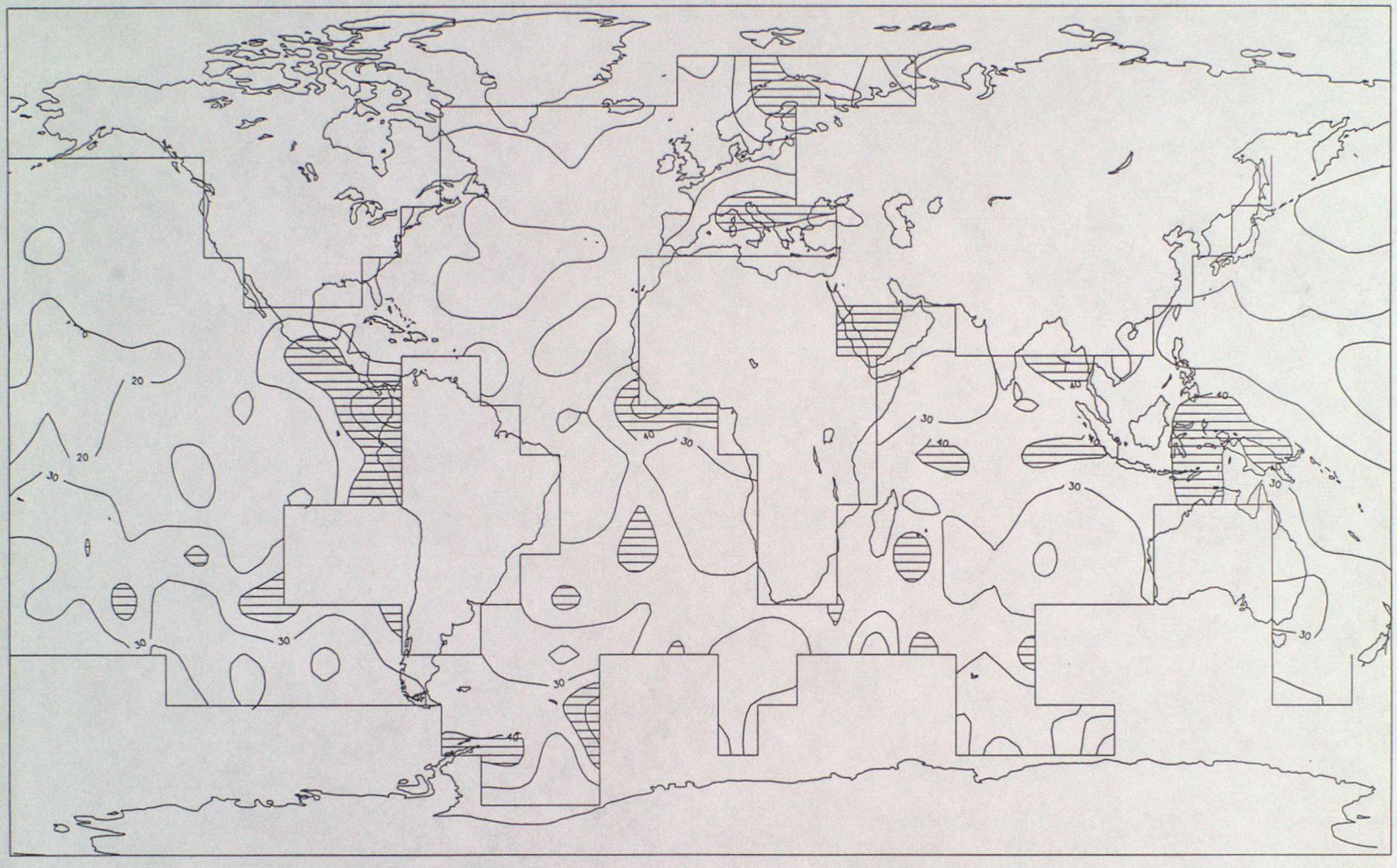
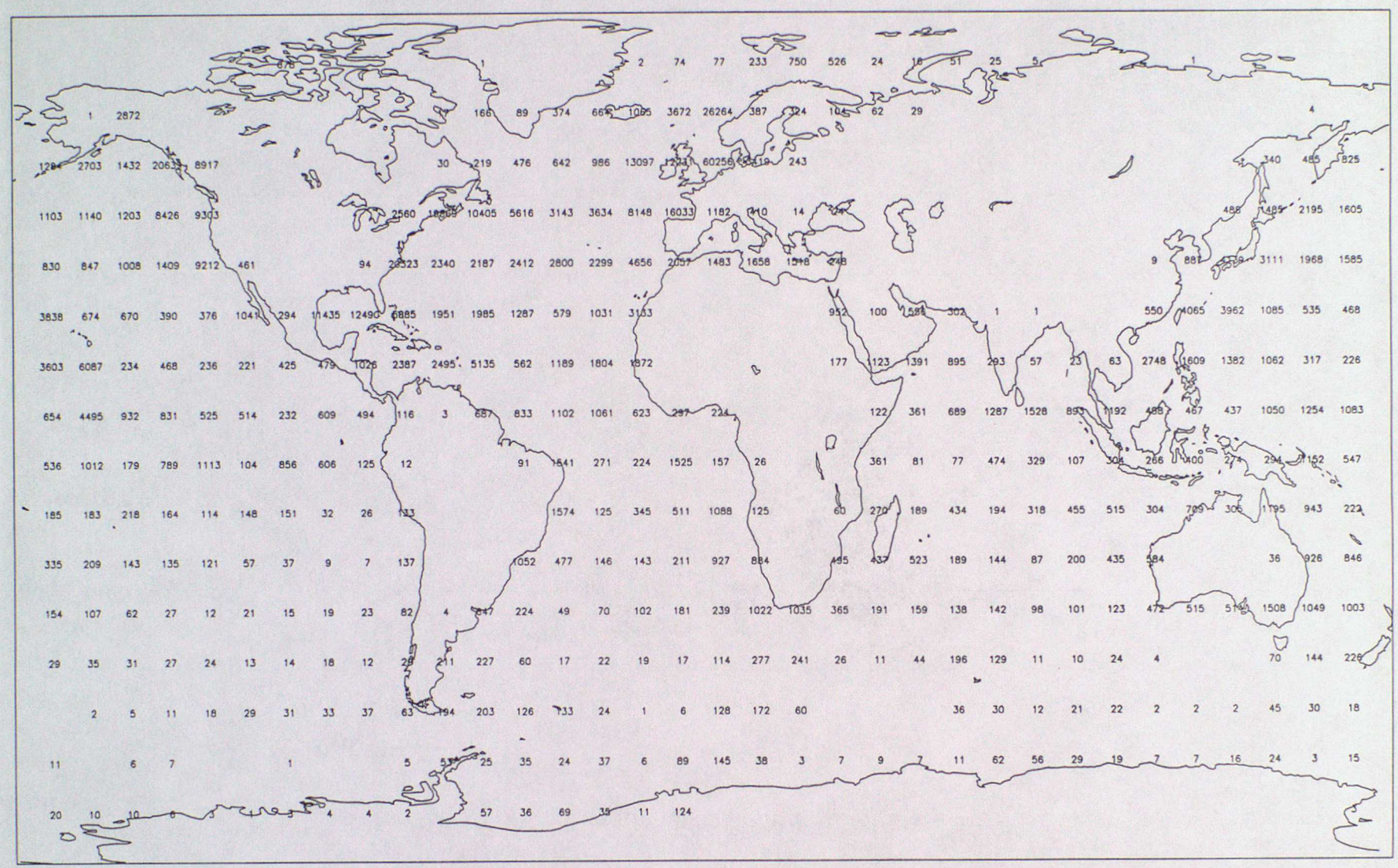
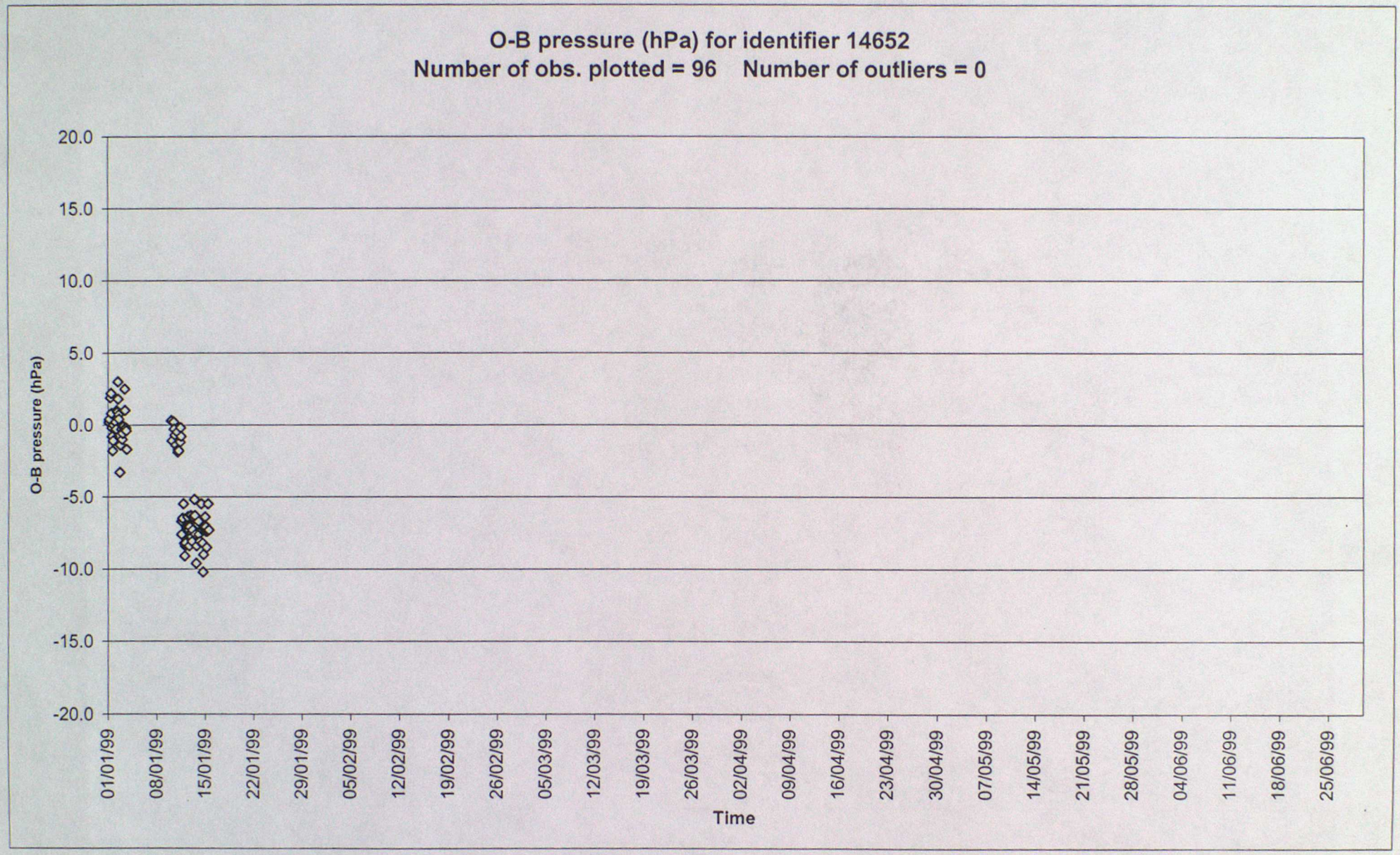
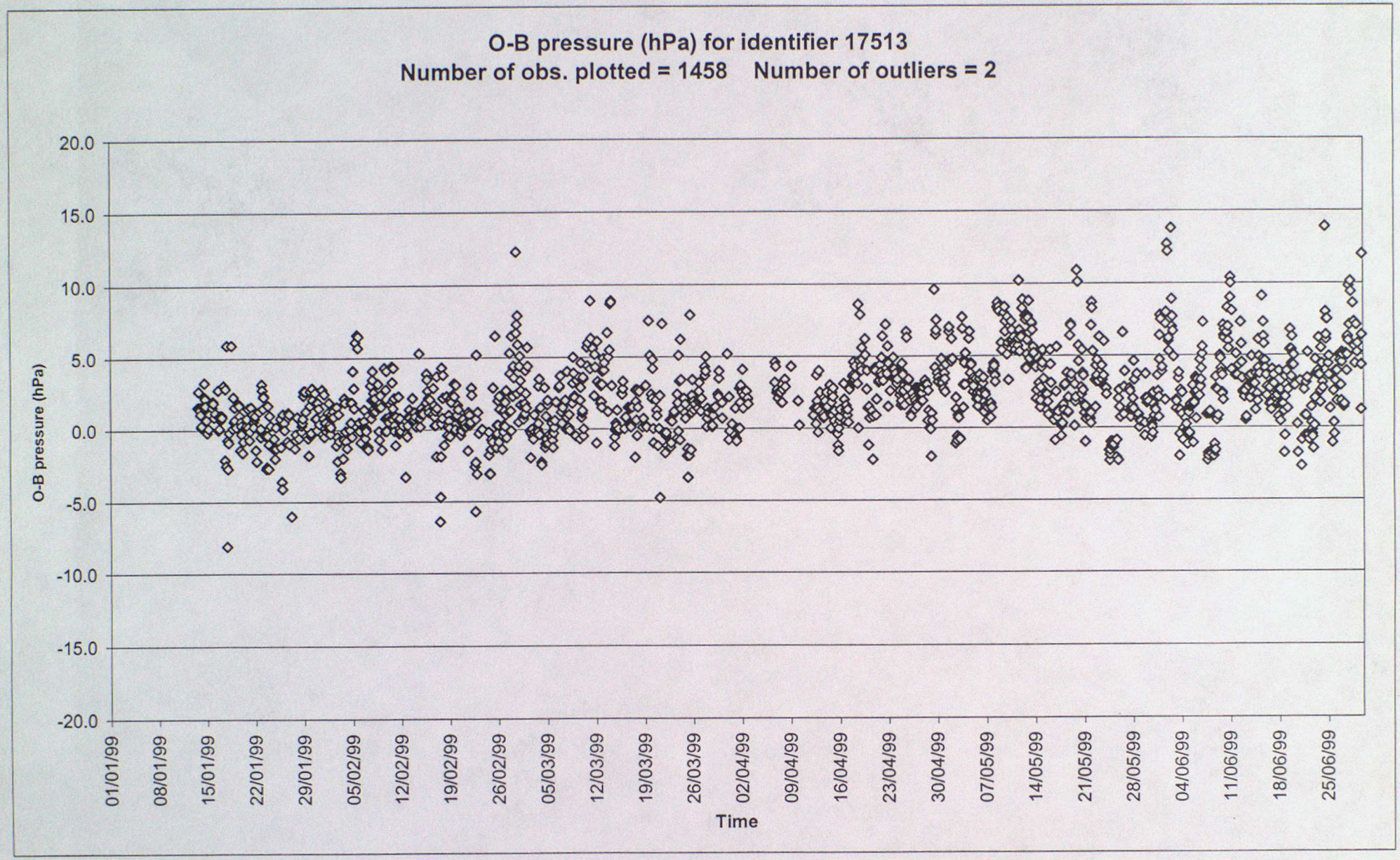
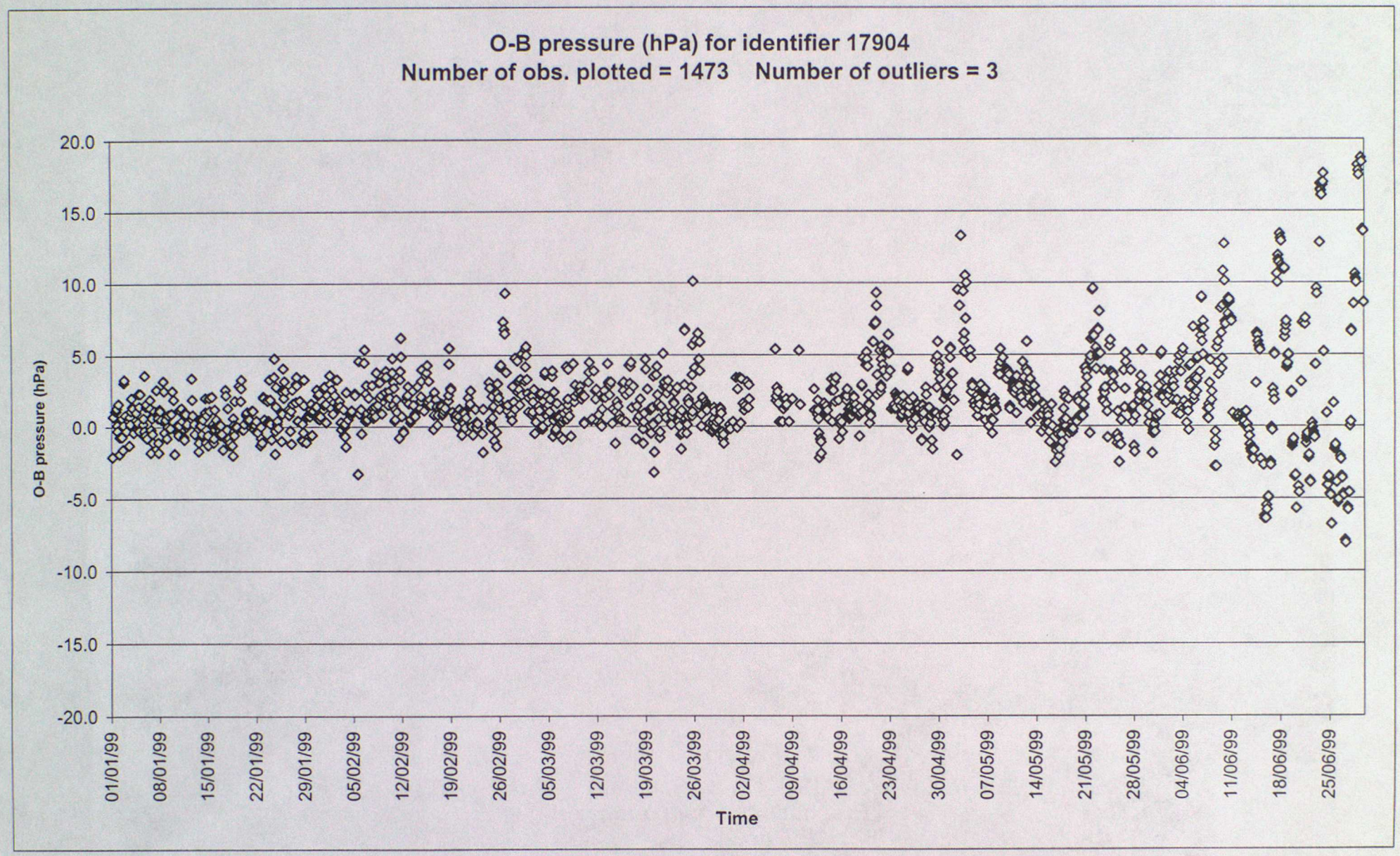


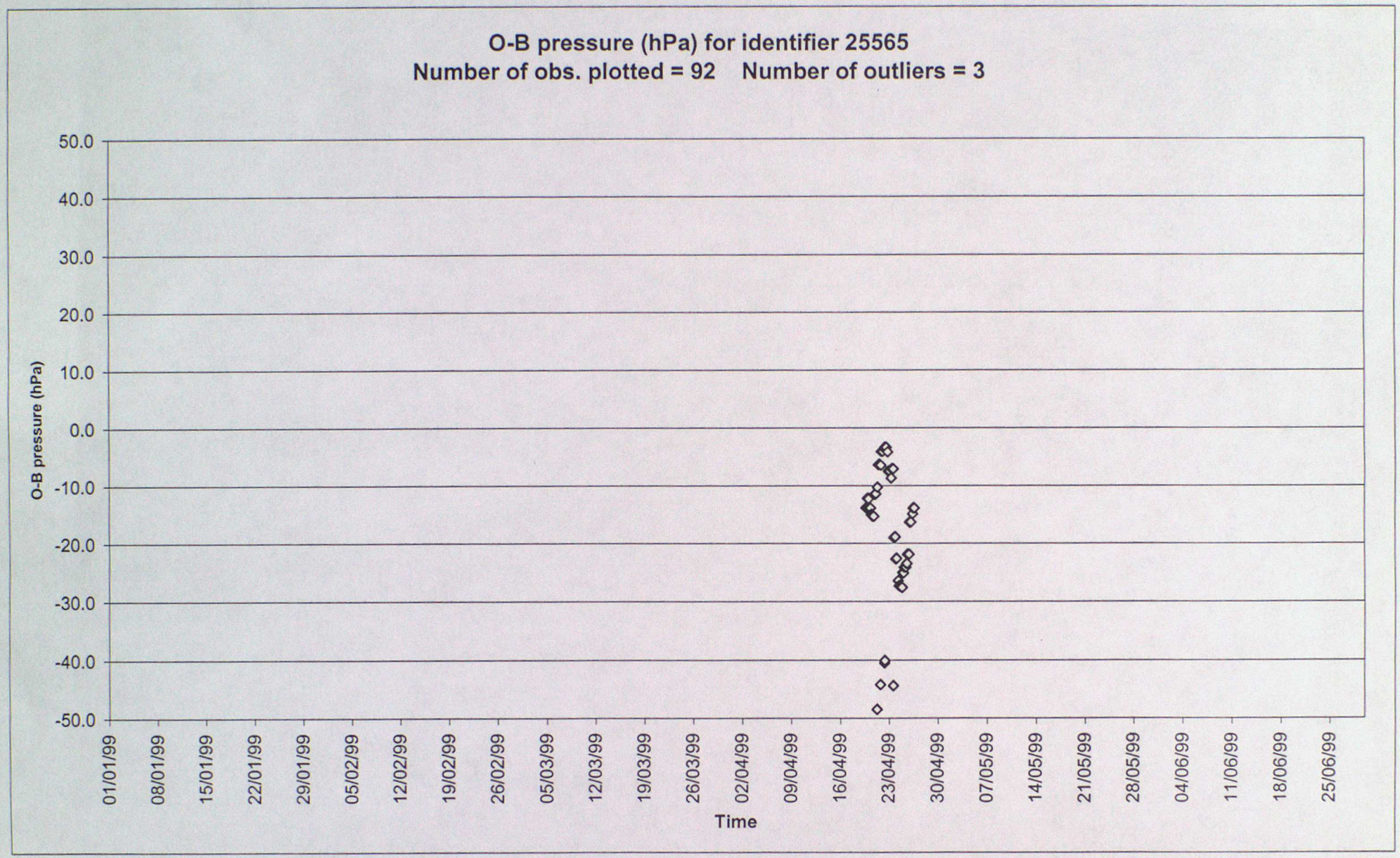
FIG 11:
PLOT OF NUMBER OF SHIP WIND DIRECTION OBS. DATE:- JANUARY - JUNE 1999
ONLY OBSERVATIONS PASSING QUALITY CONTROL INCLUDED

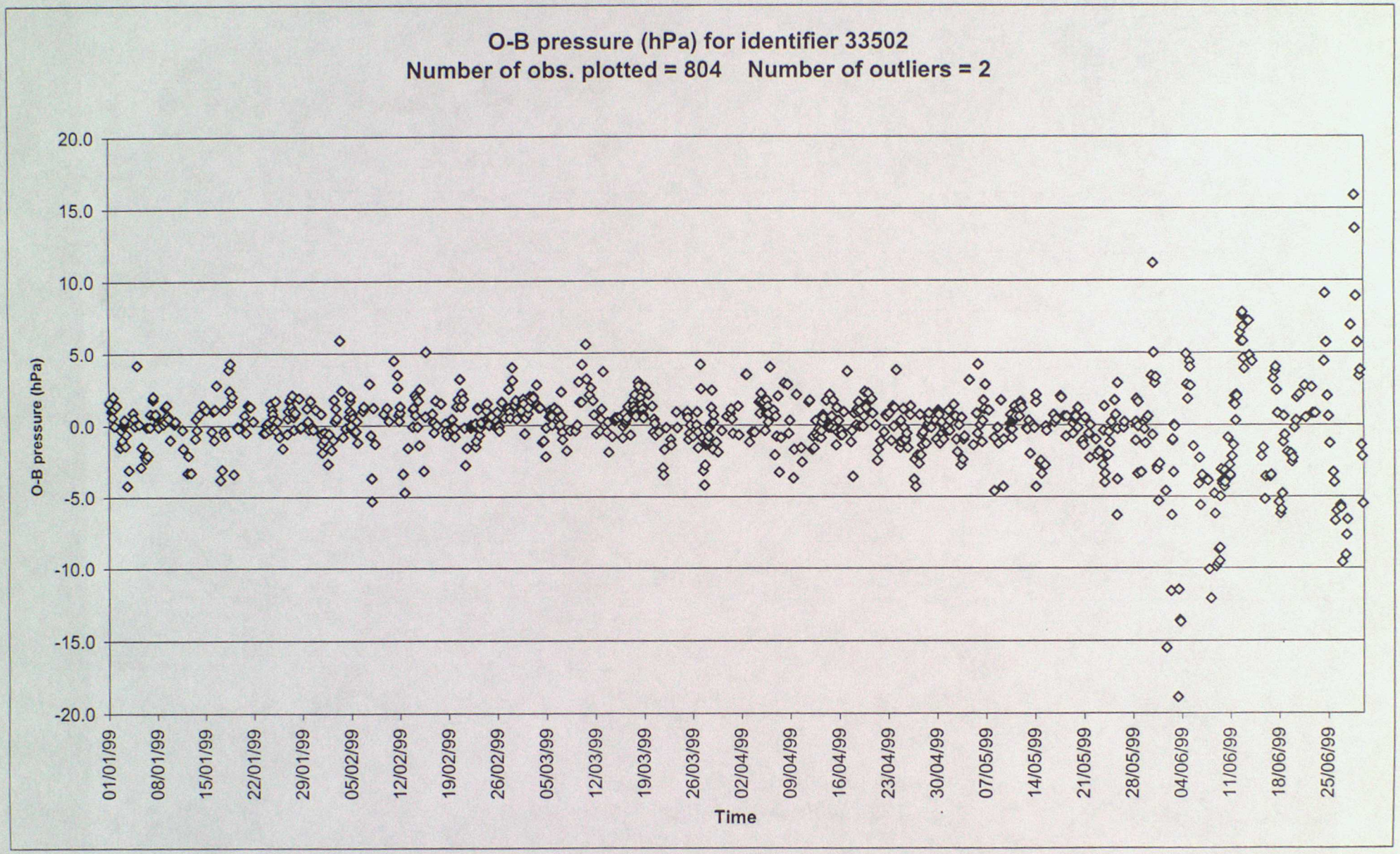


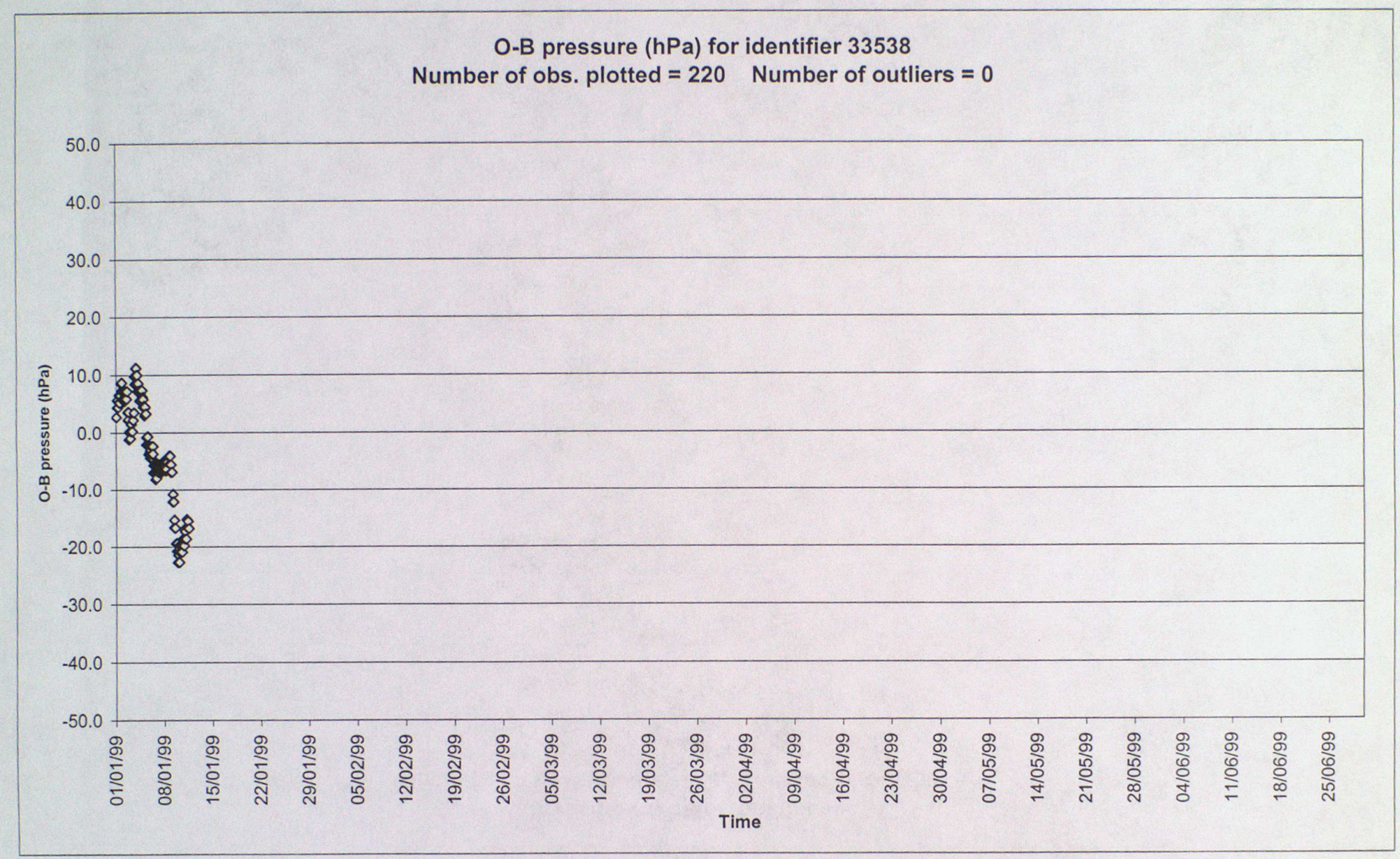

O-B pressure (hPa) for identifier 14652
Number of obs. plotted = 96 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

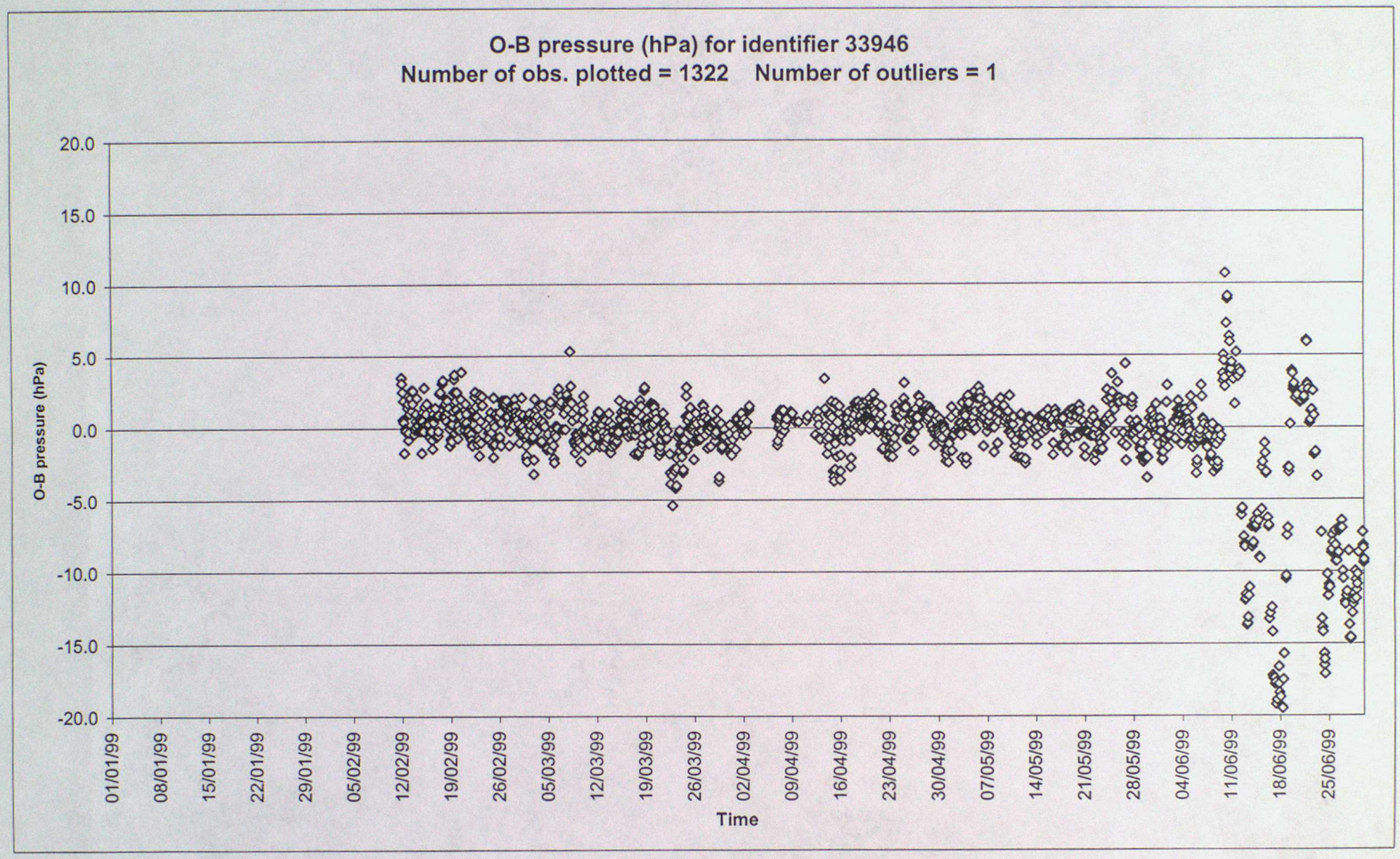

O-B pressure (hPa) for identifier 17513
Number of obs. plotted = 1458 Number of outliers = 2
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

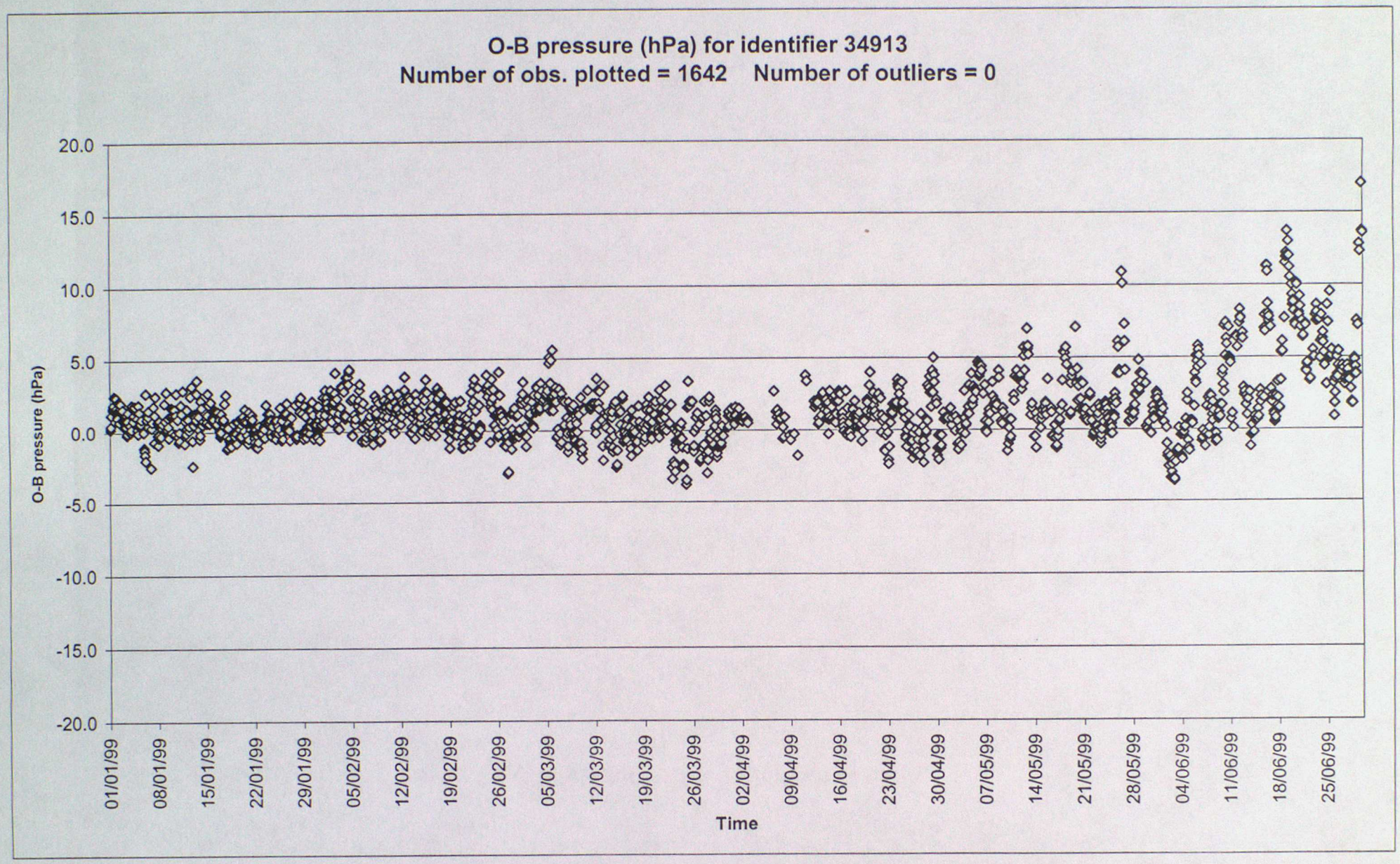

O-B pressure (hPa) for identifier 17904
Number of obs. plotted = 1473 Number of outliers = 3
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

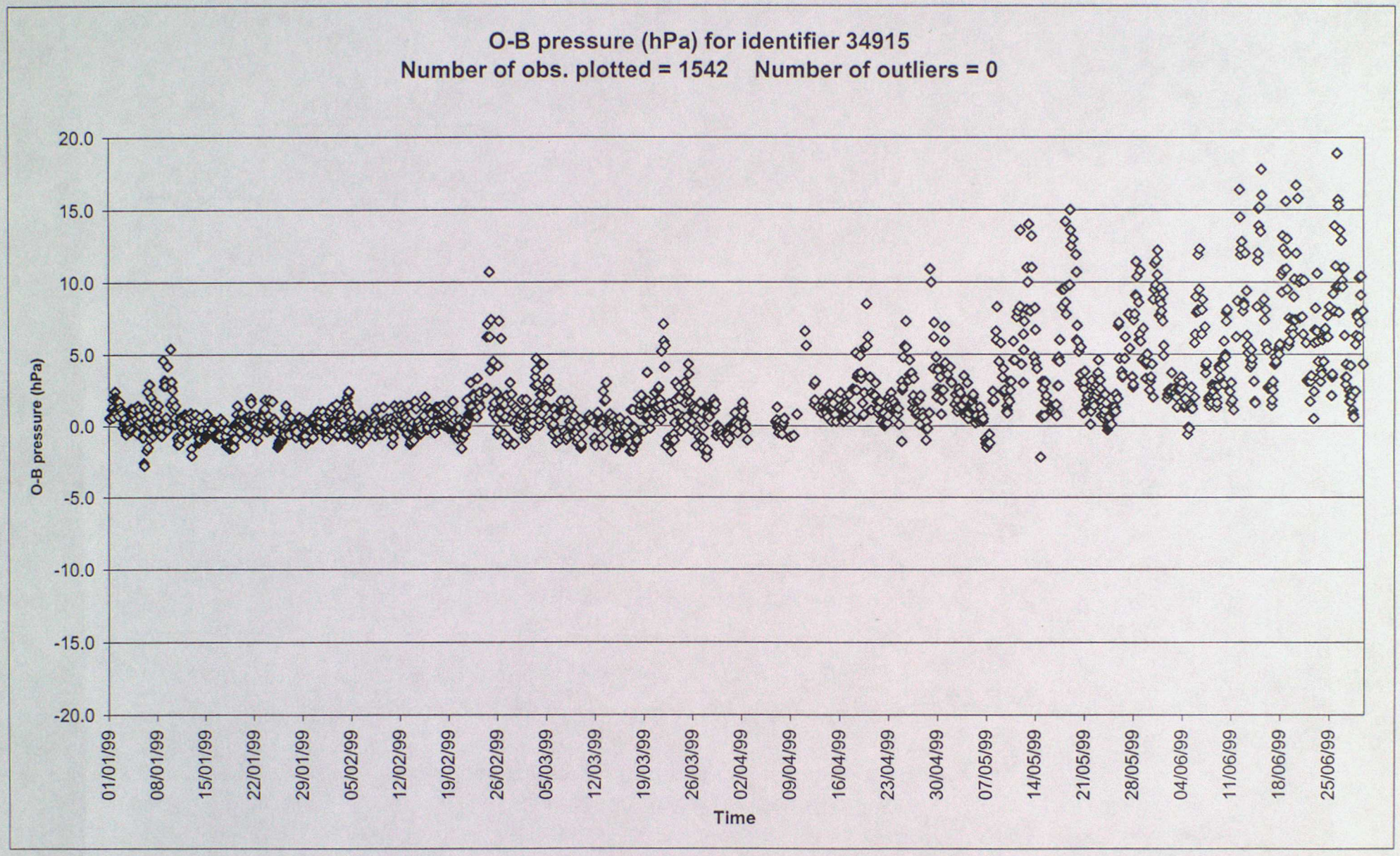

O-B pressure (hPa) for identifier 25565
Number of obs. plotted = 92 Number of outliers = 3
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

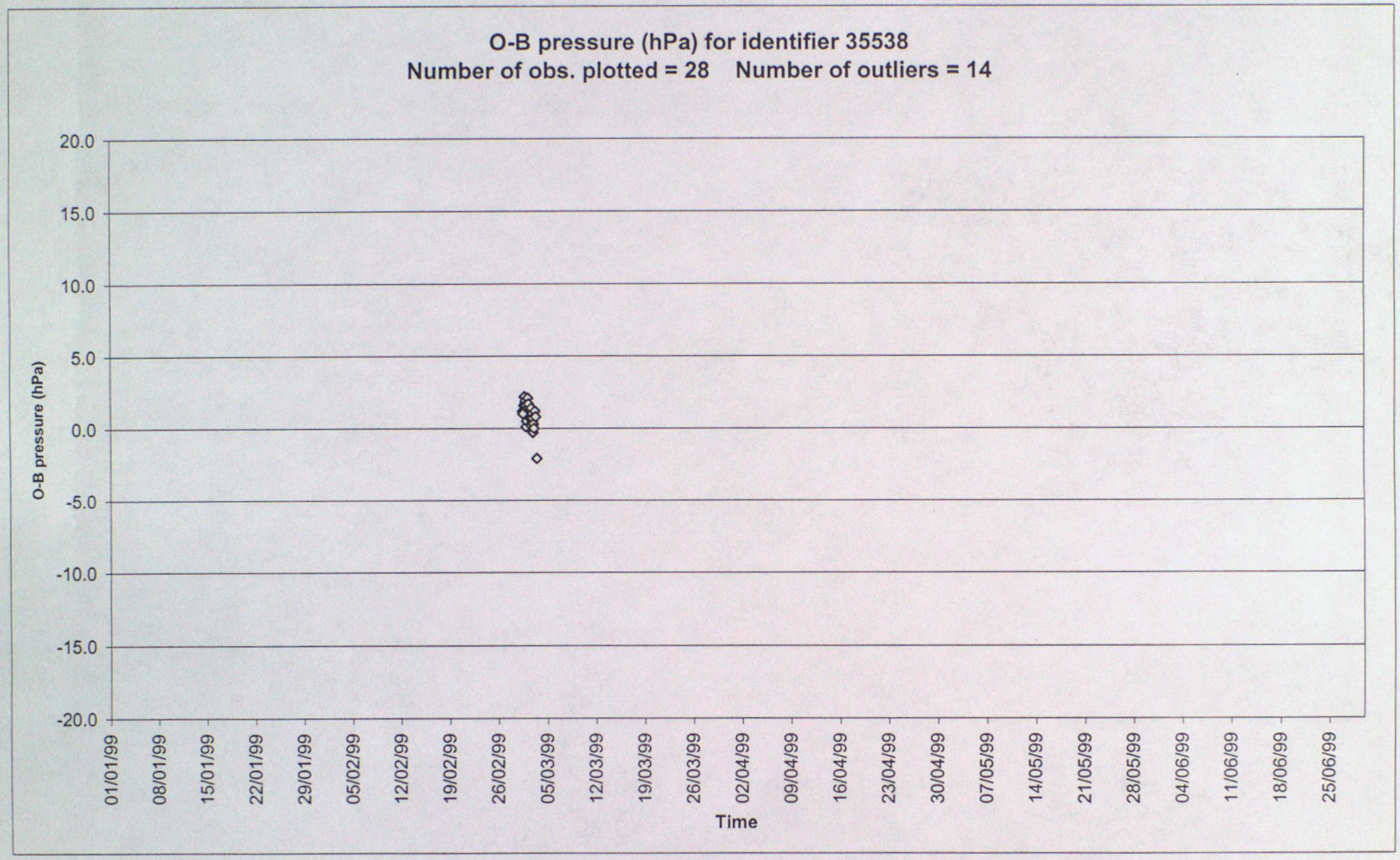

O-B pressure (hPa) for identifier 33502
Number of obs. plotted = 804 Number of outliers = 2
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

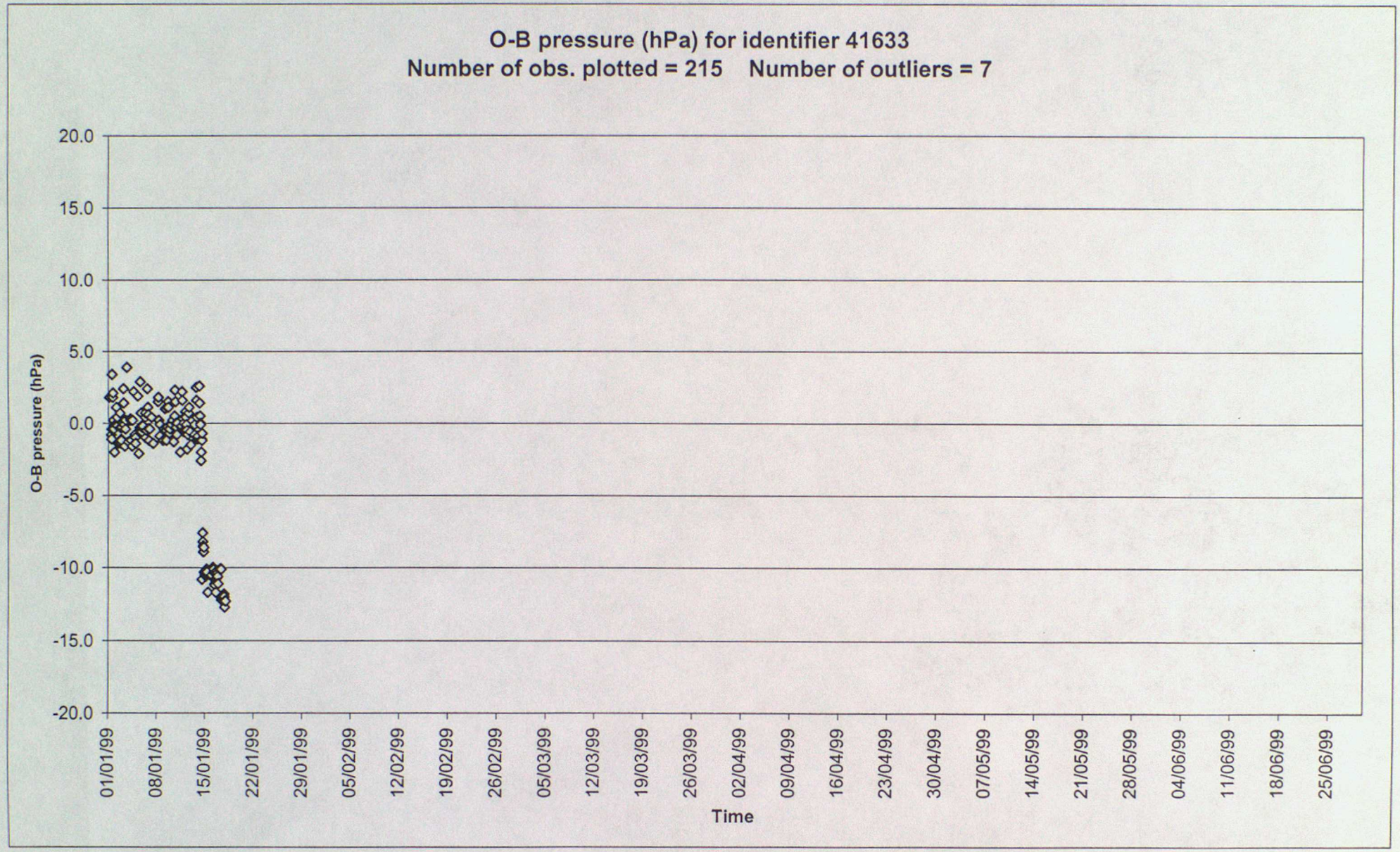

O-B pressure (hPa) for identifier 33538
Number of obs. plotted = 220 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

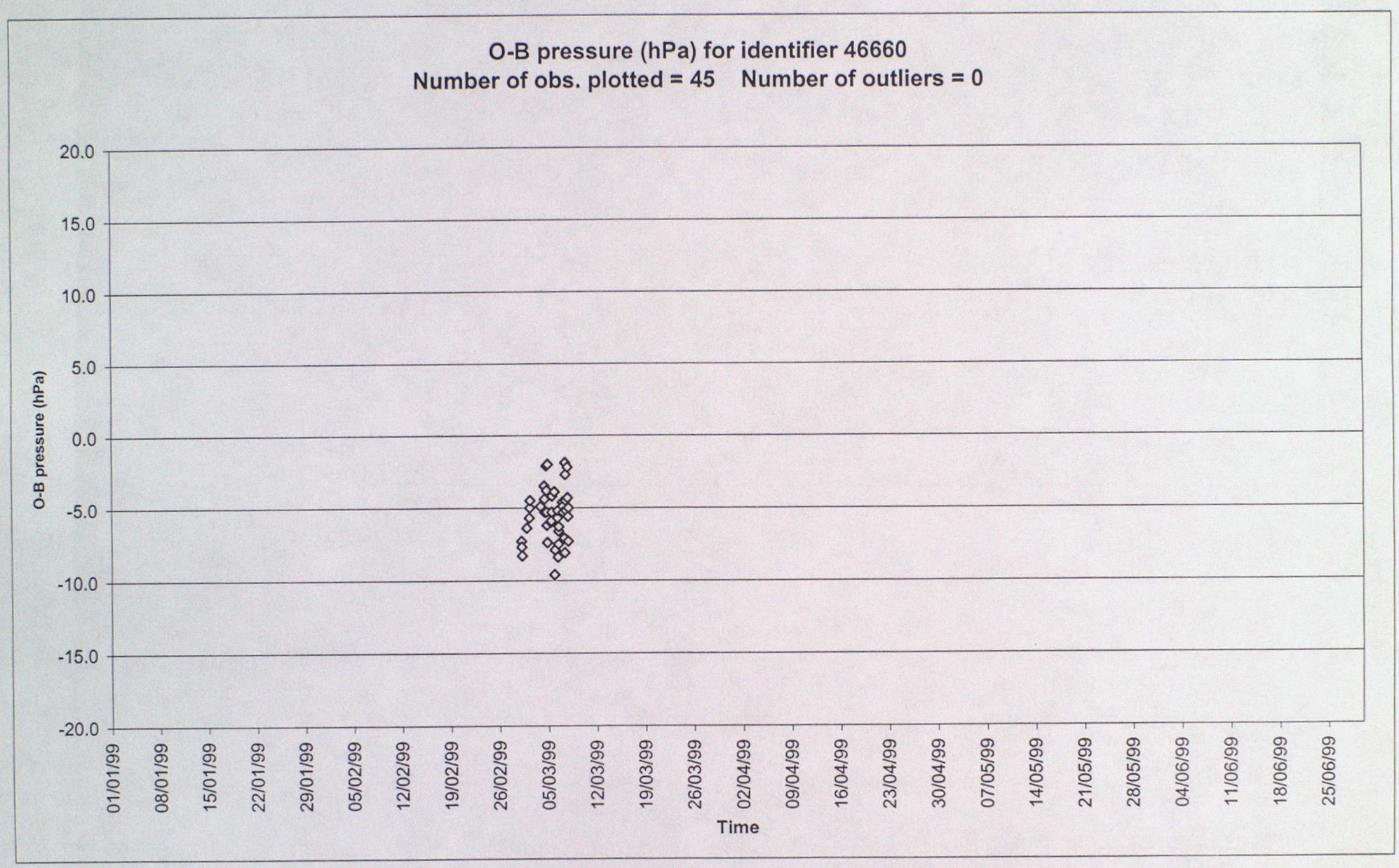

O-B pressure (hPa) for identifier 33946
Number of obs. plotted = 1322 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

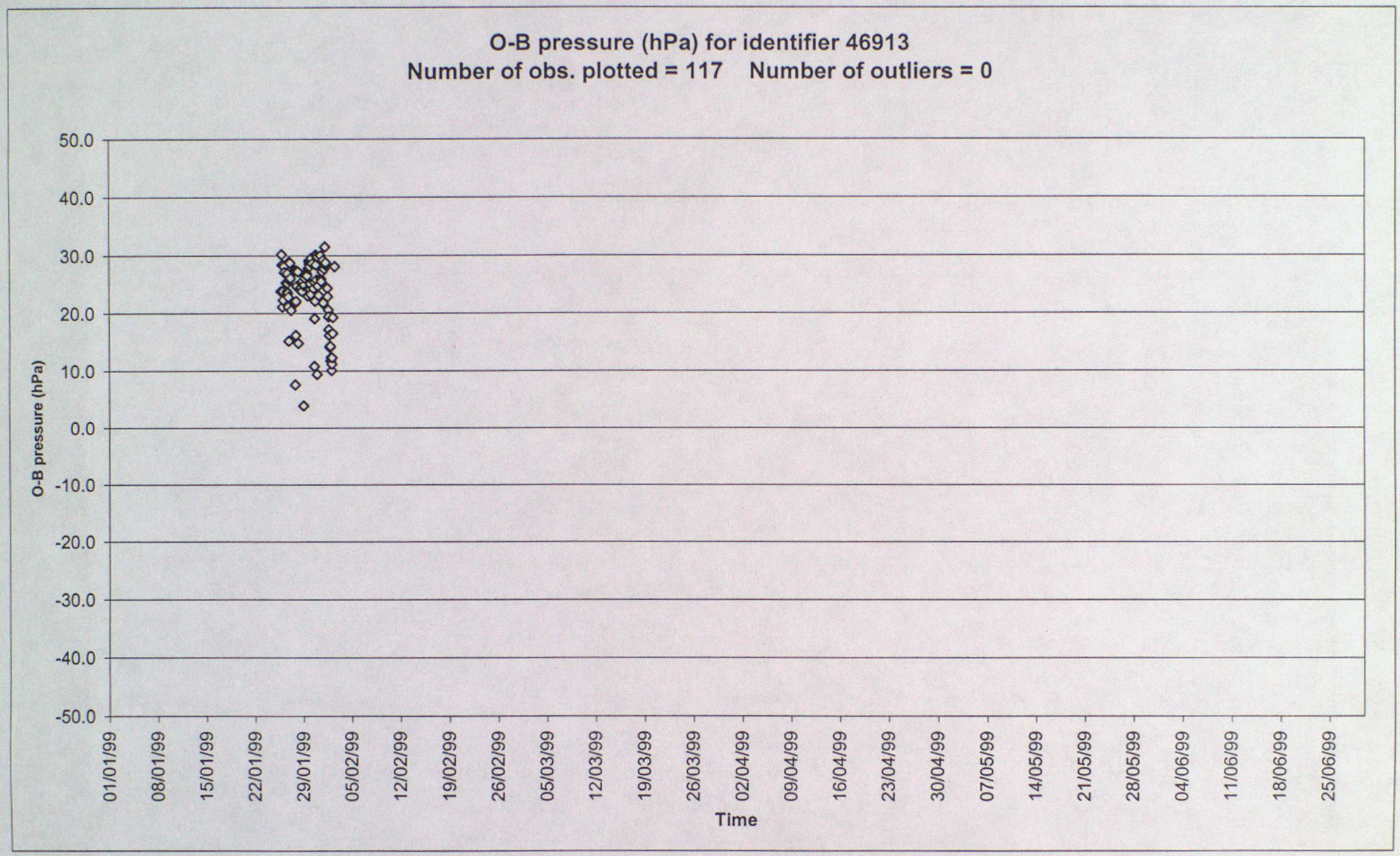

O-B pressure (hPa) for identifier 34913
Number of obs. plotted = 1642 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

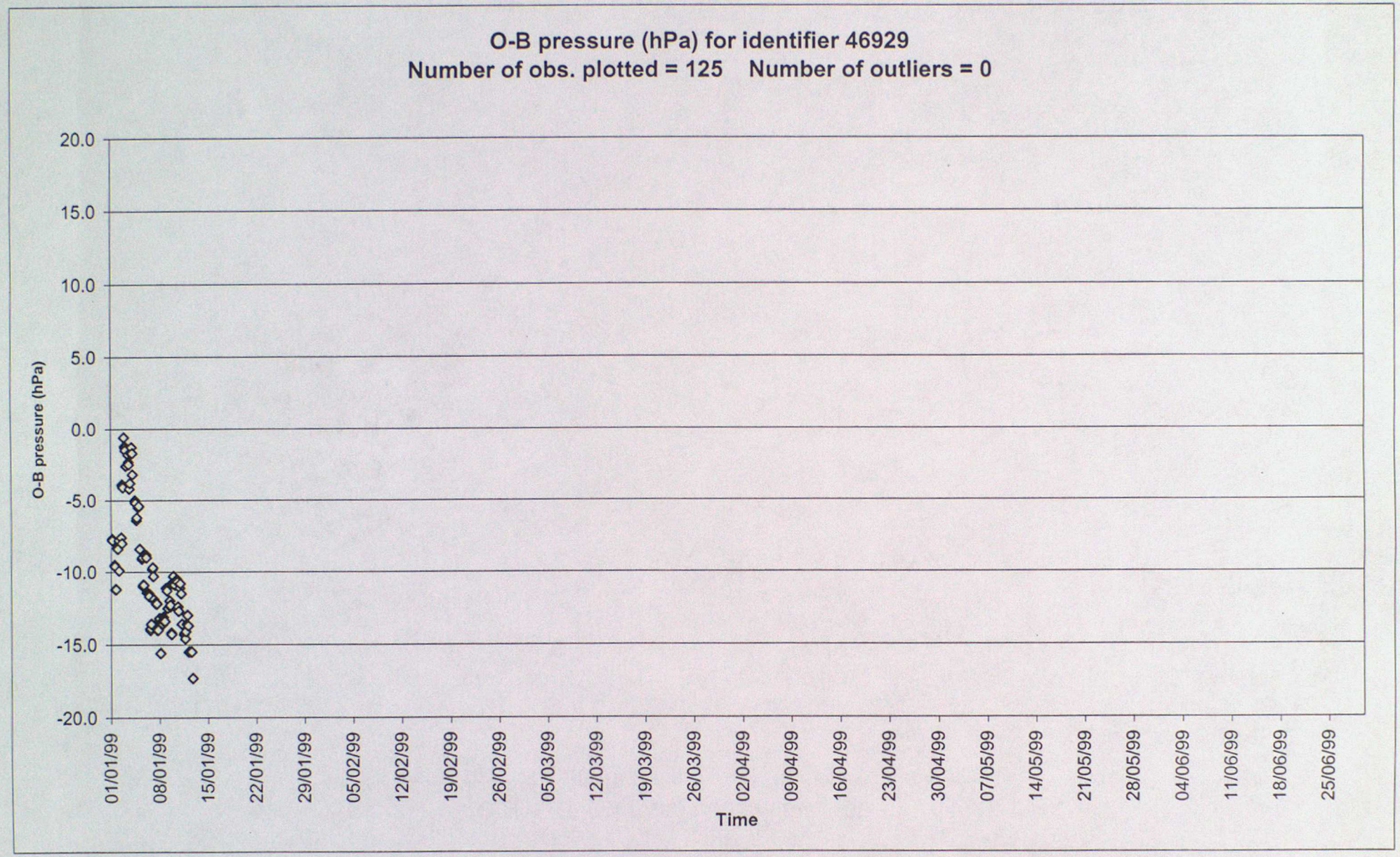

O-B pressure (hPa) for identifier 34915
Number of obs. plotted = 1542 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

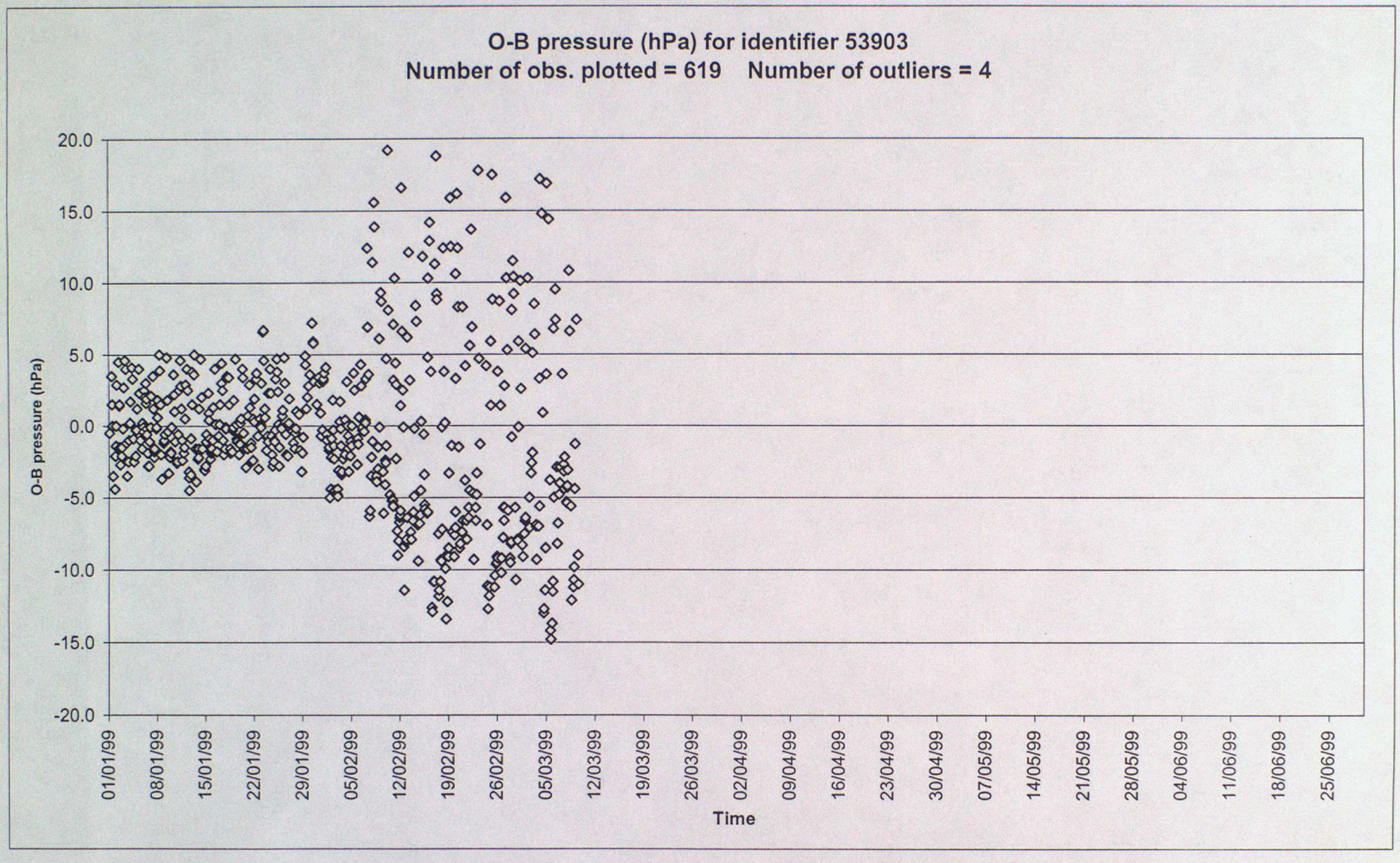

O-B pressure (hPa) for identifier 35538
Number of obs. plotted = 28 Number of outliers = 14
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
O-B pressure (hPa)
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

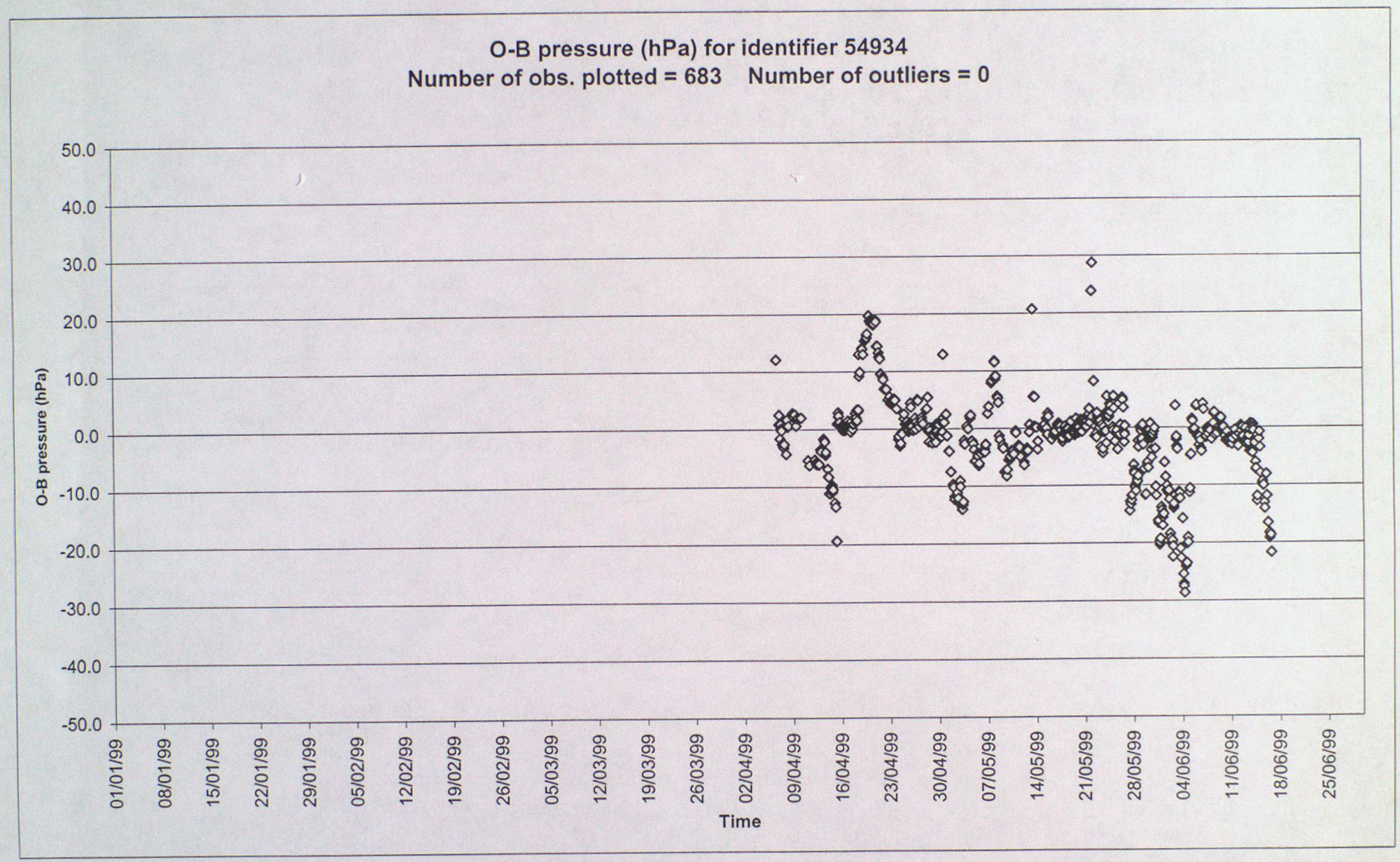

O-B pressure (hPa) for identifier 41633
Number of obs. plotted = 215 Number of outliers = 7
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

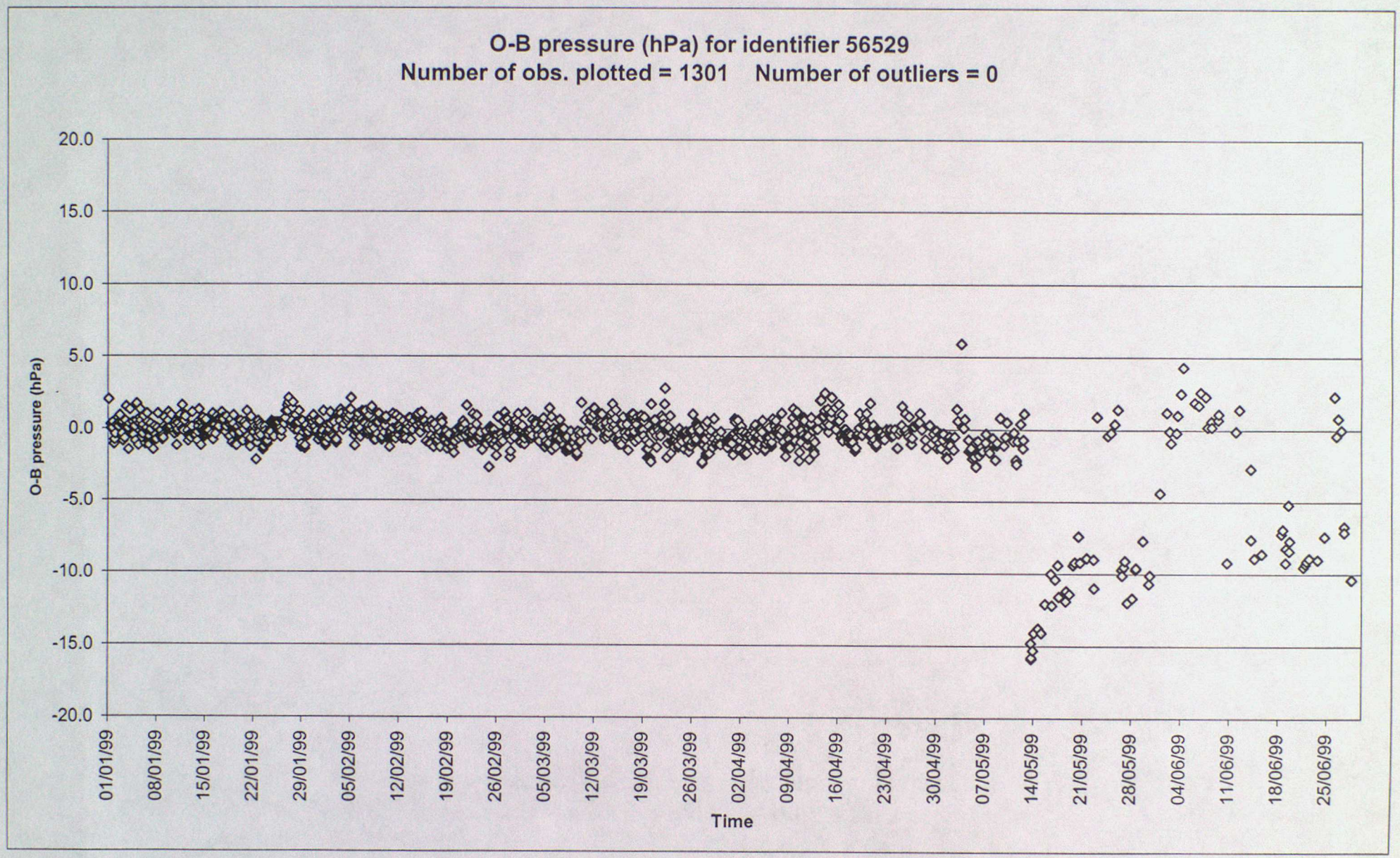

O-B pressure (hPa) for identifier 46660
Number of obs. plotted = 45 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

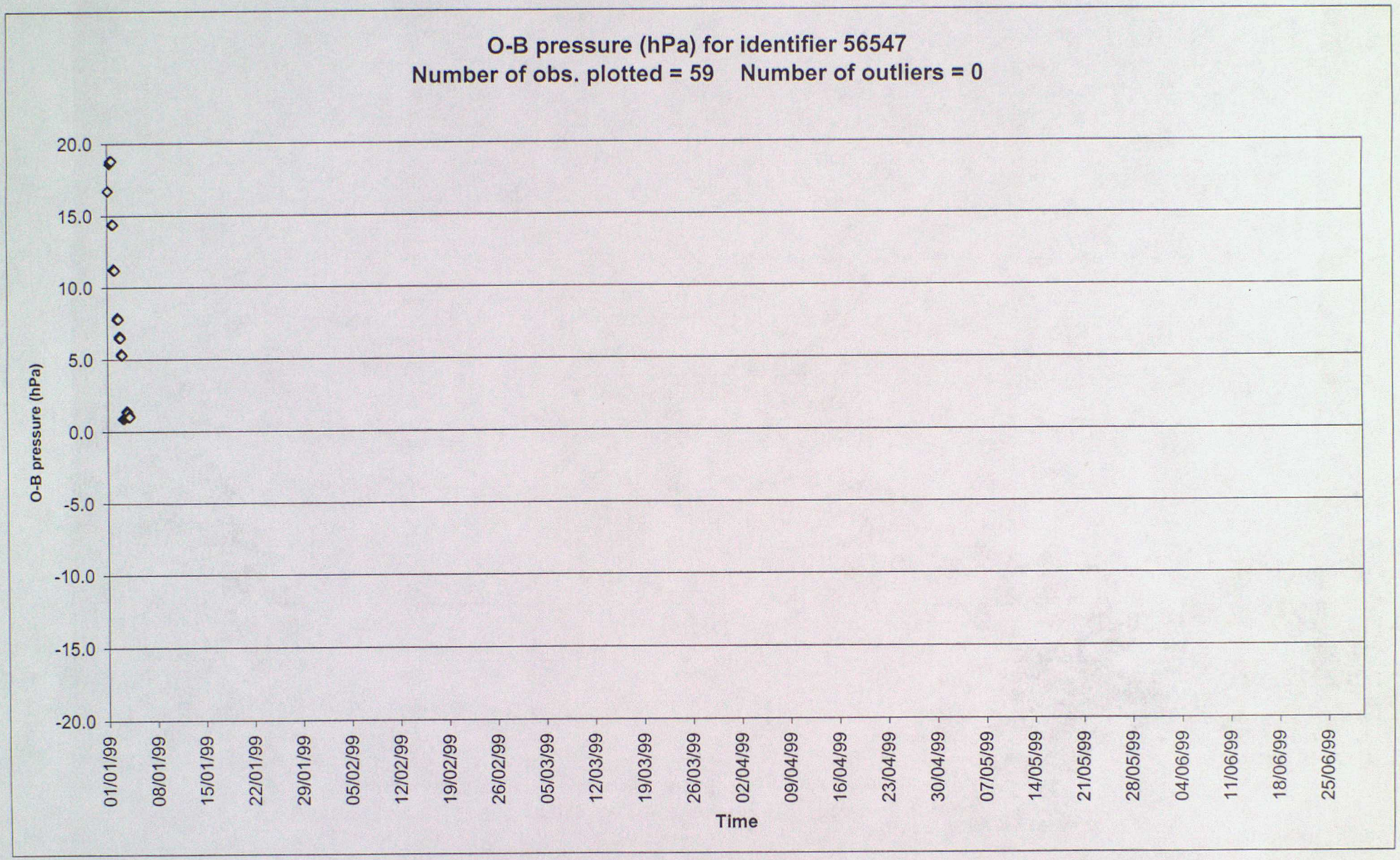

O-B pressure (hPa) for identifier 46913
Number of obs. plotted = 117 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

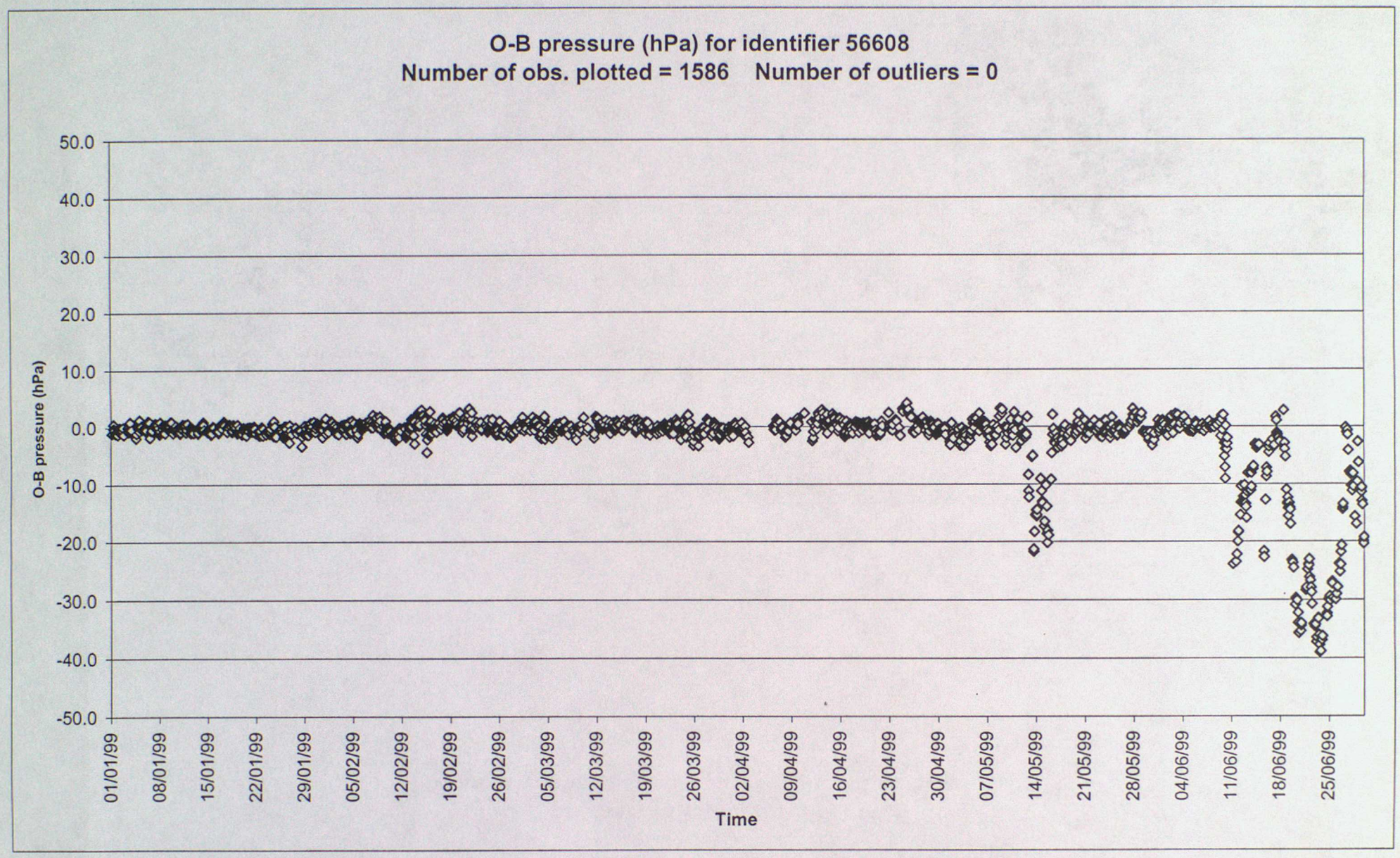

O-B pressure (hPa) for identifier 46929
Number of obs. plotted = 125 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

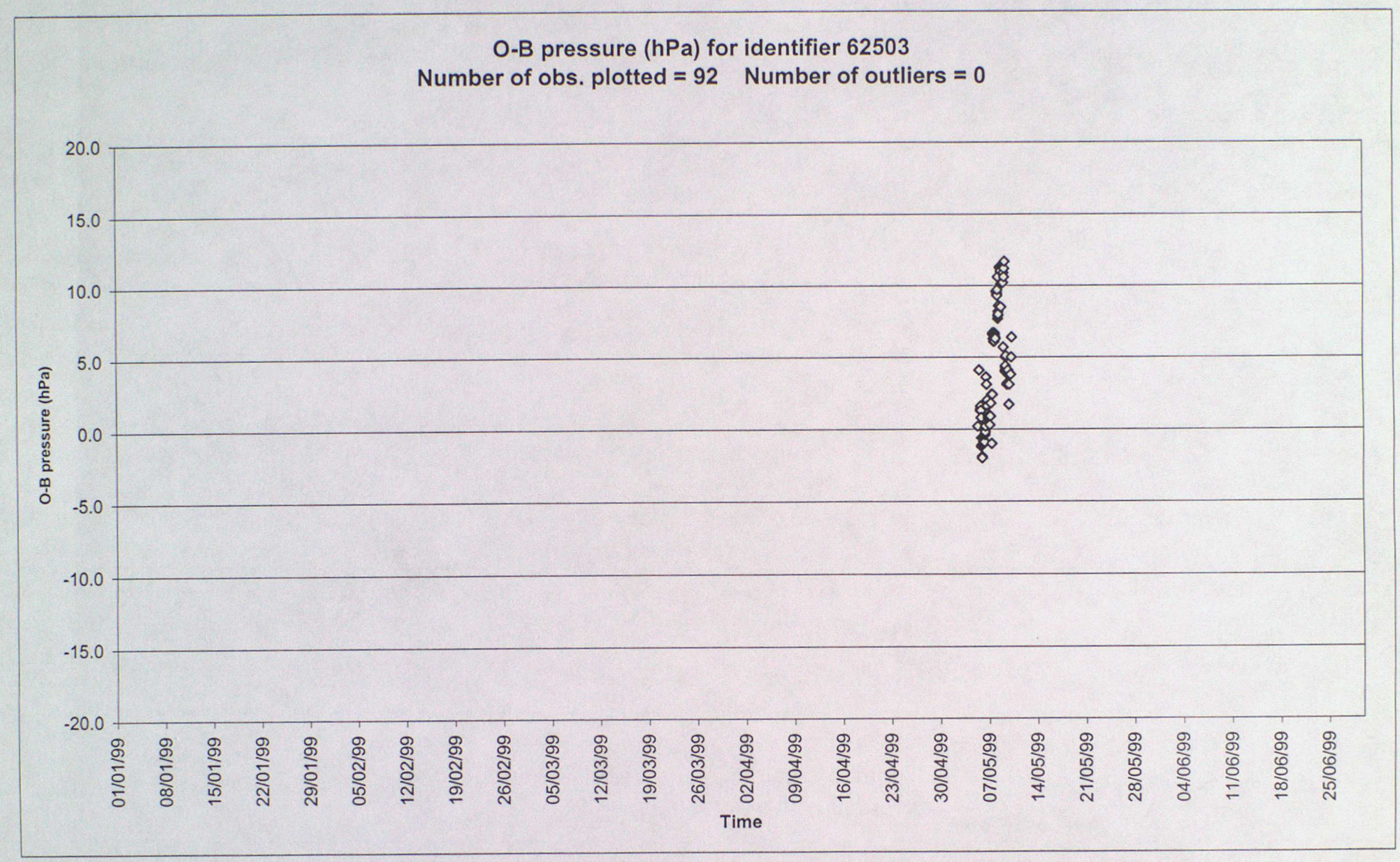

O-B pressure (hPa) for identifier 53903
Number of obs. plotted = 619 Number of outliers = 4
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

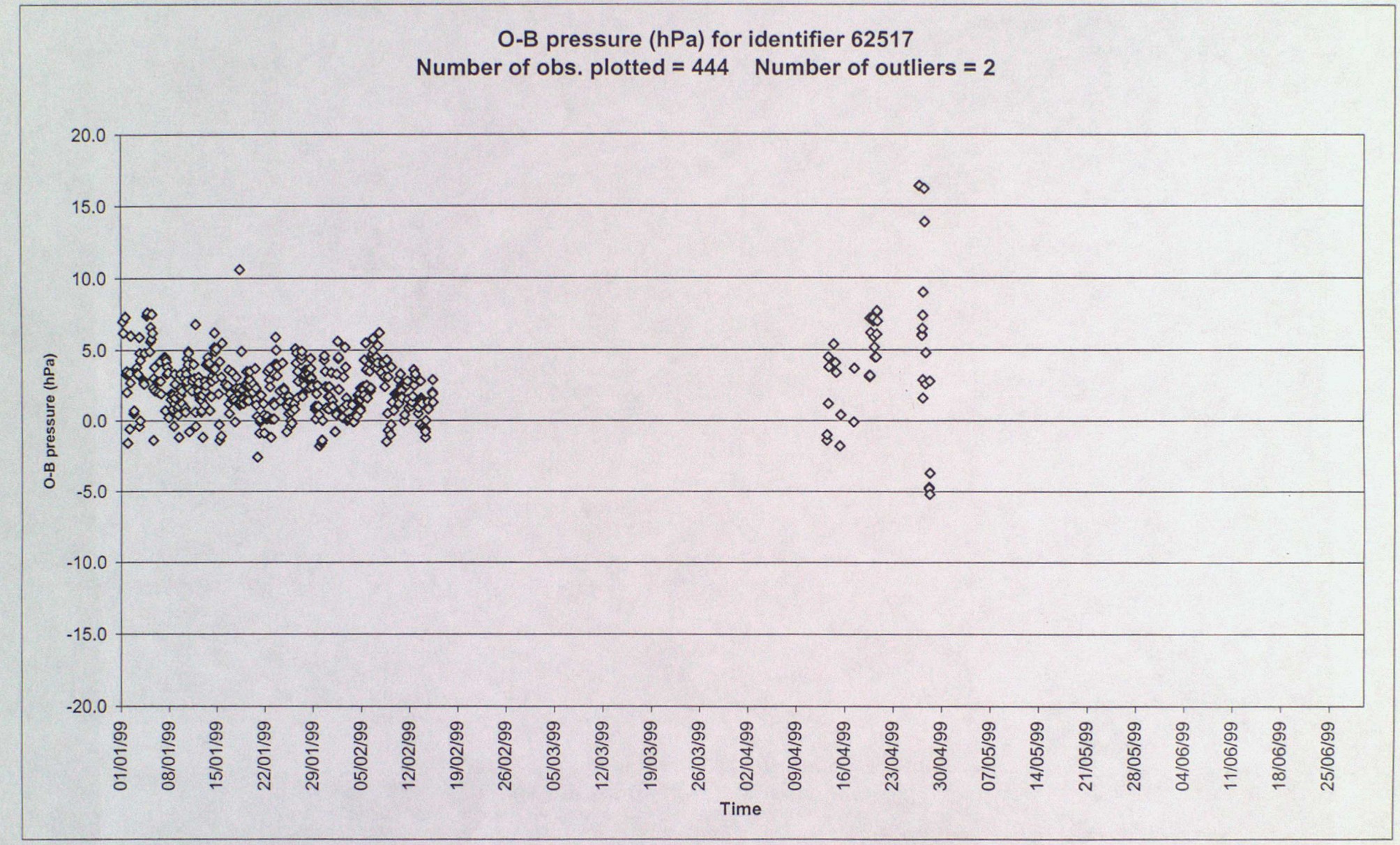

O-B pressure (hPa) for identifier 54934
Number of obs. plotted = 683 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

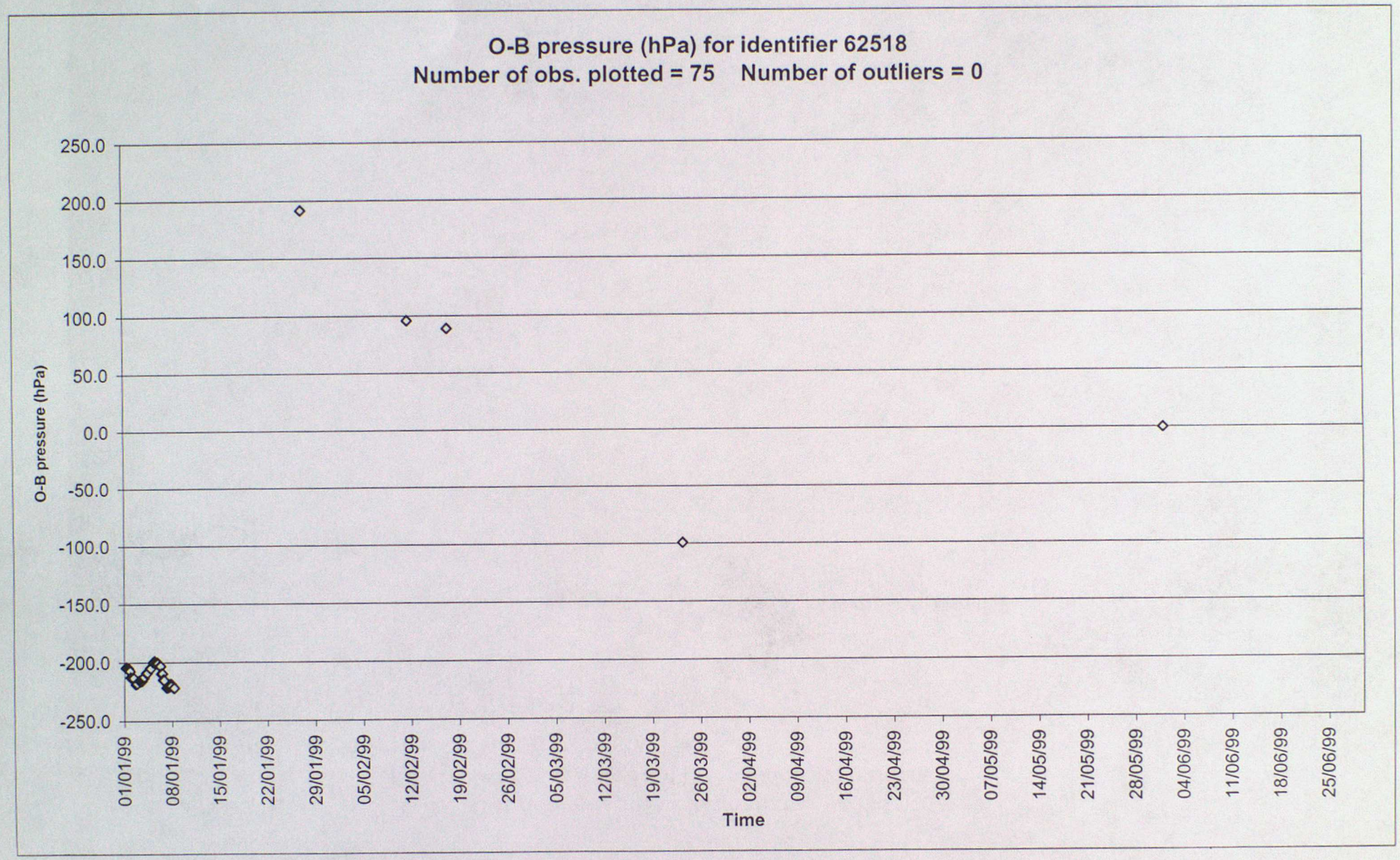

O-B pressure (hPa) for identifier 56529
Number of obs. plotted = 1301 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

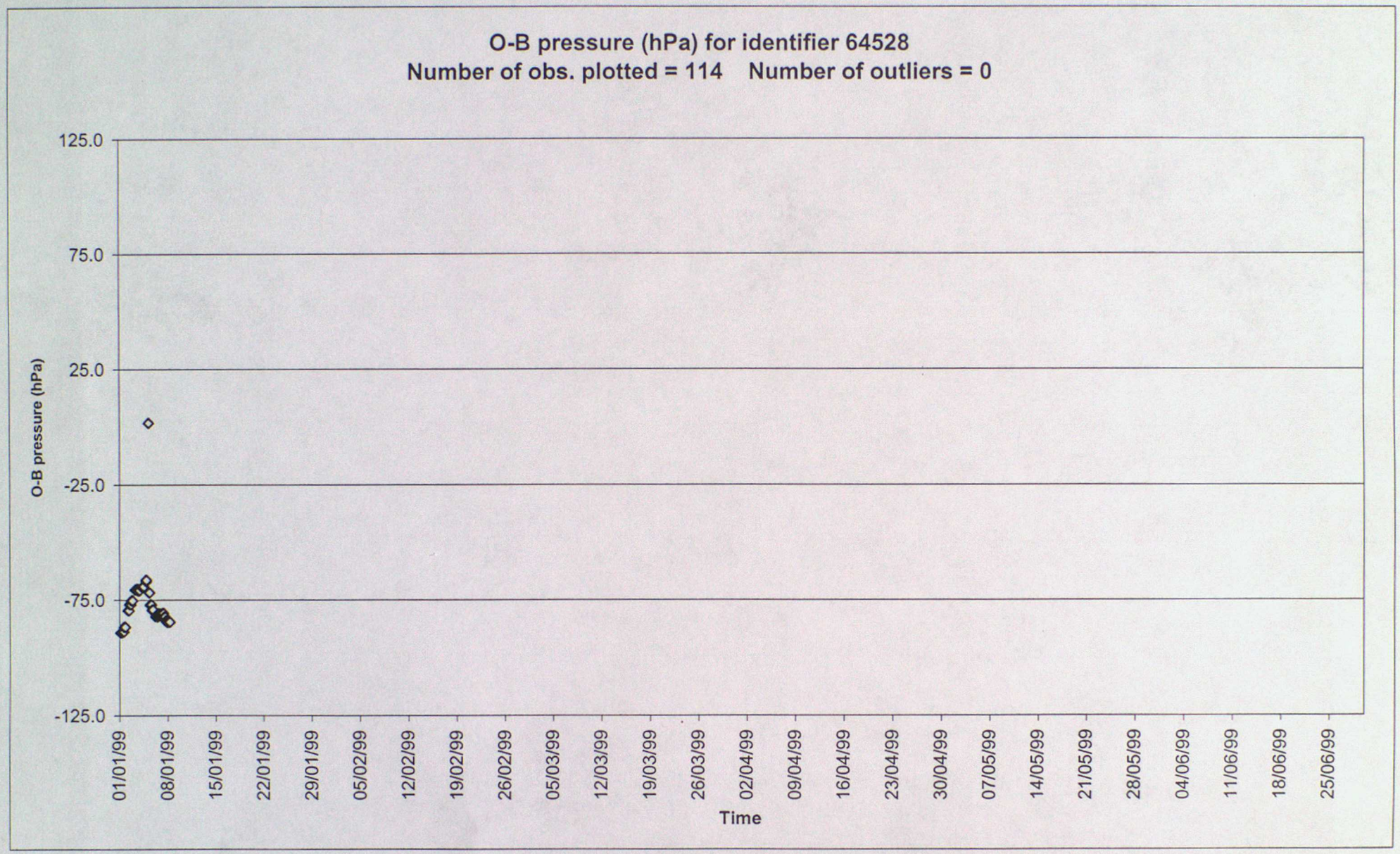

O-B pressure (hPa) for identifier 56547
Number of obs. plotted = 59 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

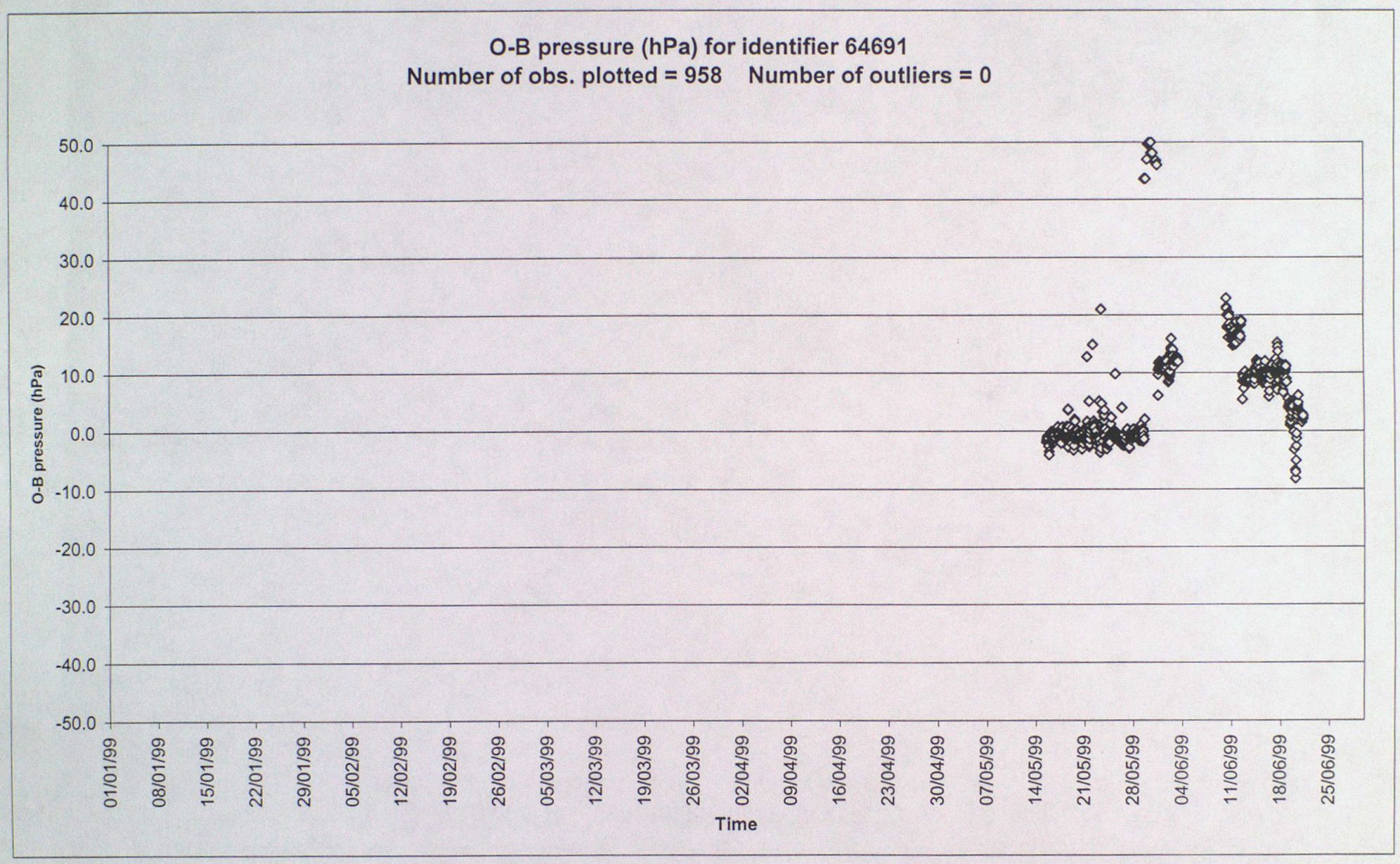

O-B pressure (hPa) for identifier 56608
Number of obs. plotted = 1586 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

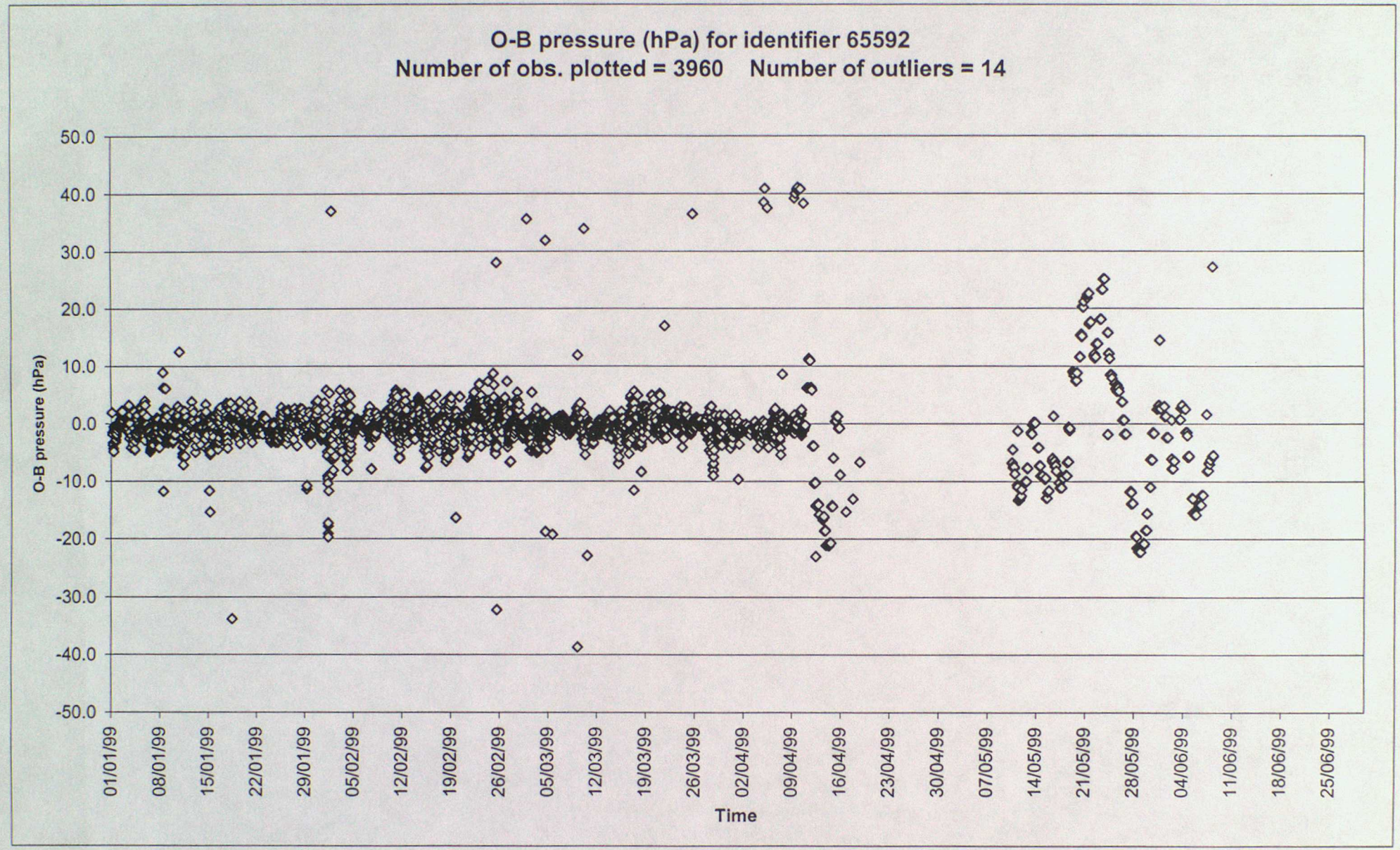

O-B pressure (hPa) for identifier 62503
Number of obs. plotted = 92 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

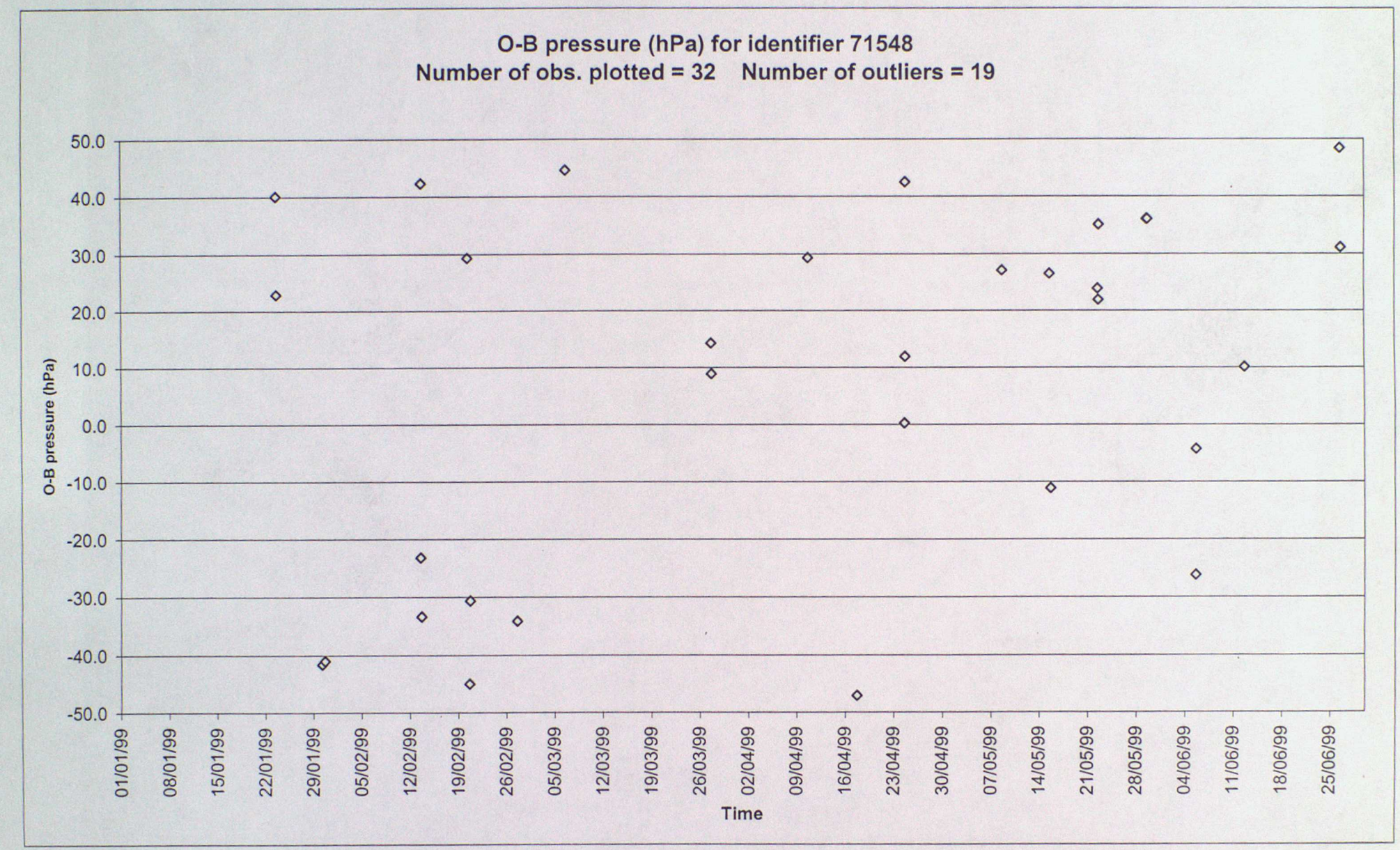

O-B pressure (hPa) for identifier 62517
Number of obs. plotted = 444 Number of outliers = 2
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

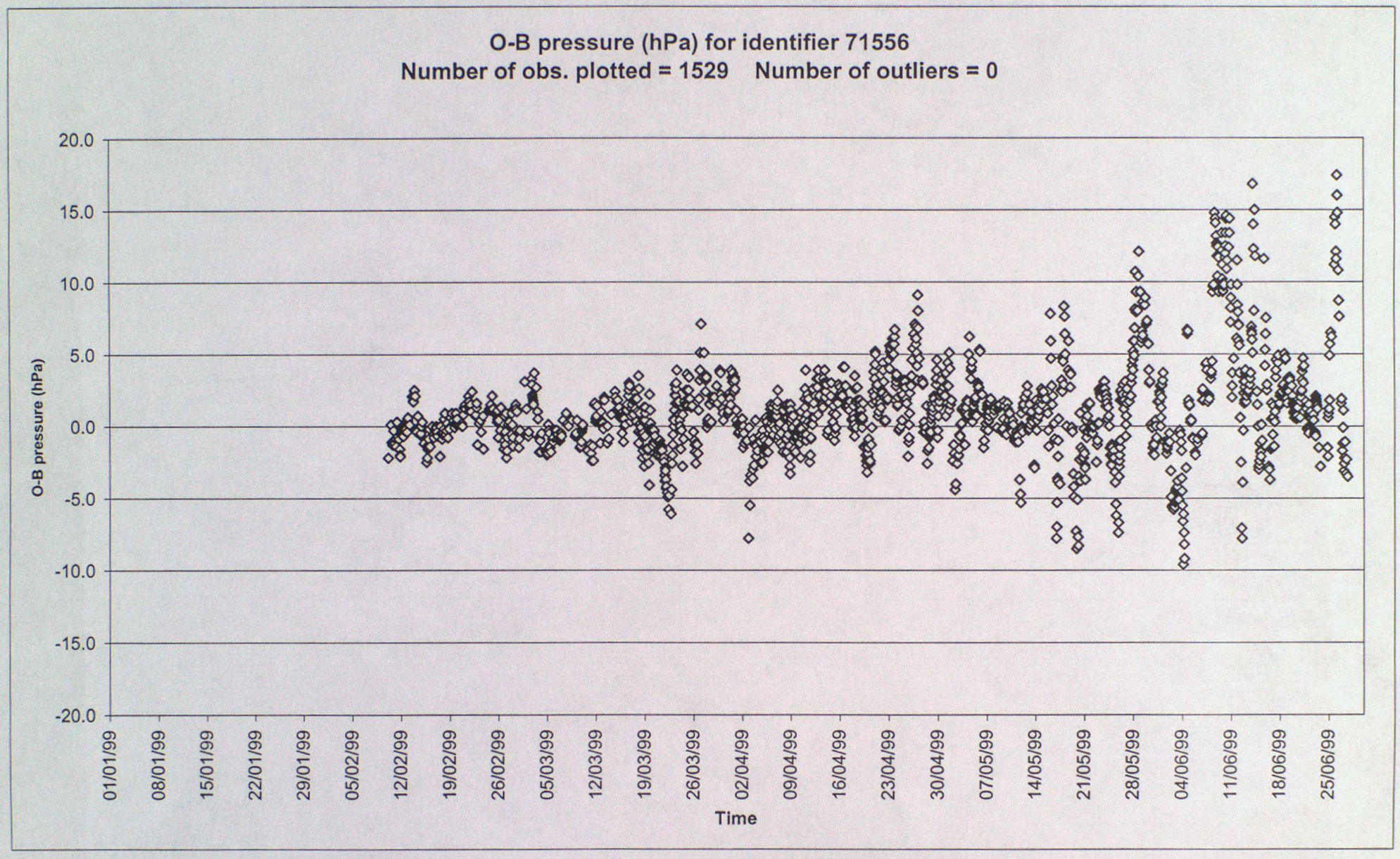

O-B pressure (hPa) for identifier 62518
Number of obs. plotted = 75 Number of outliers = 0
O-B pressure (hPa)
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

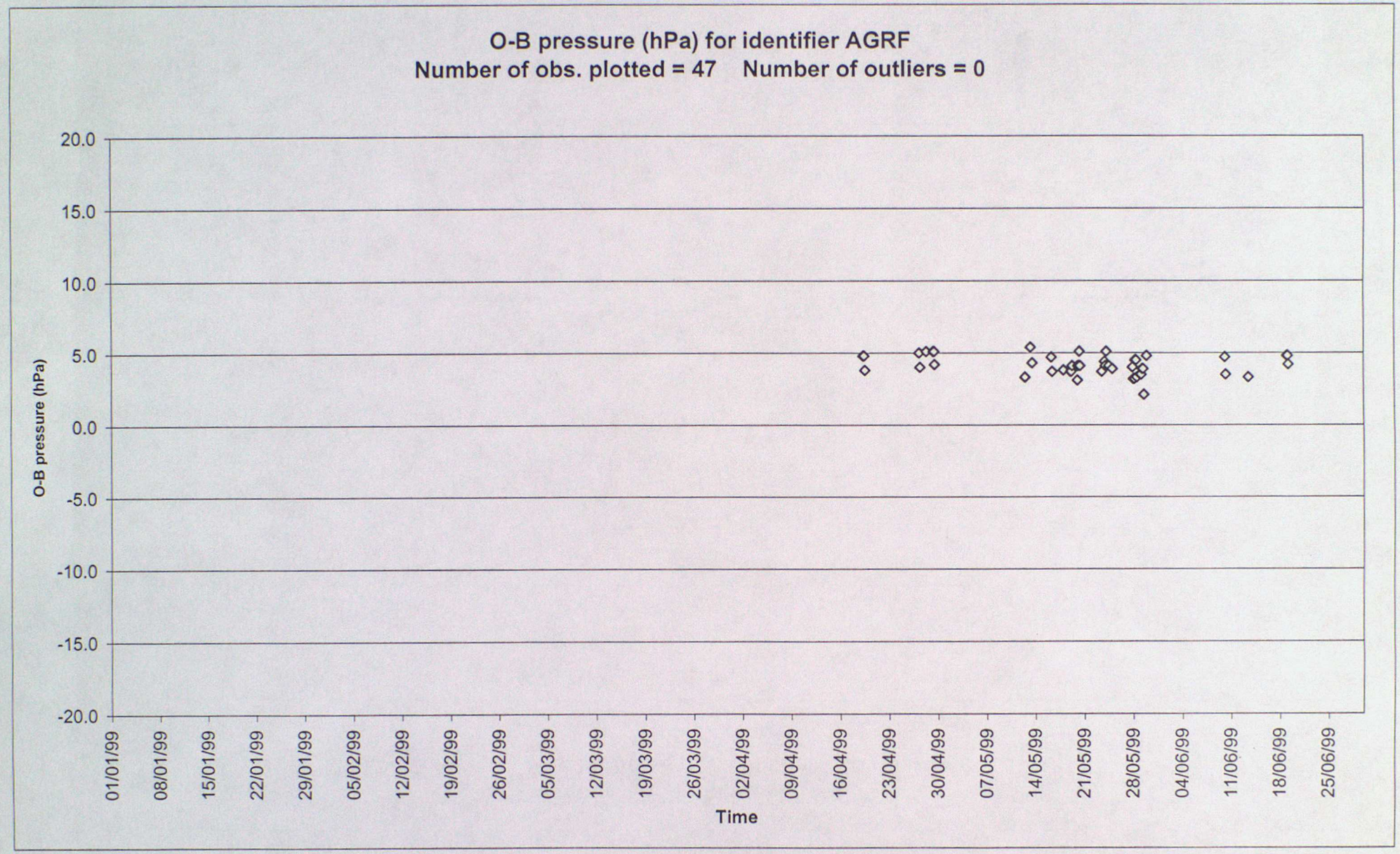

O-B pressure (hPa) for identifier 64528
Number of obs. plotted = 114 Number of outliers = 0
125.0
75.0
25.0
-25.0
-75.0
-125.0
O-B pressure (hPa)
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

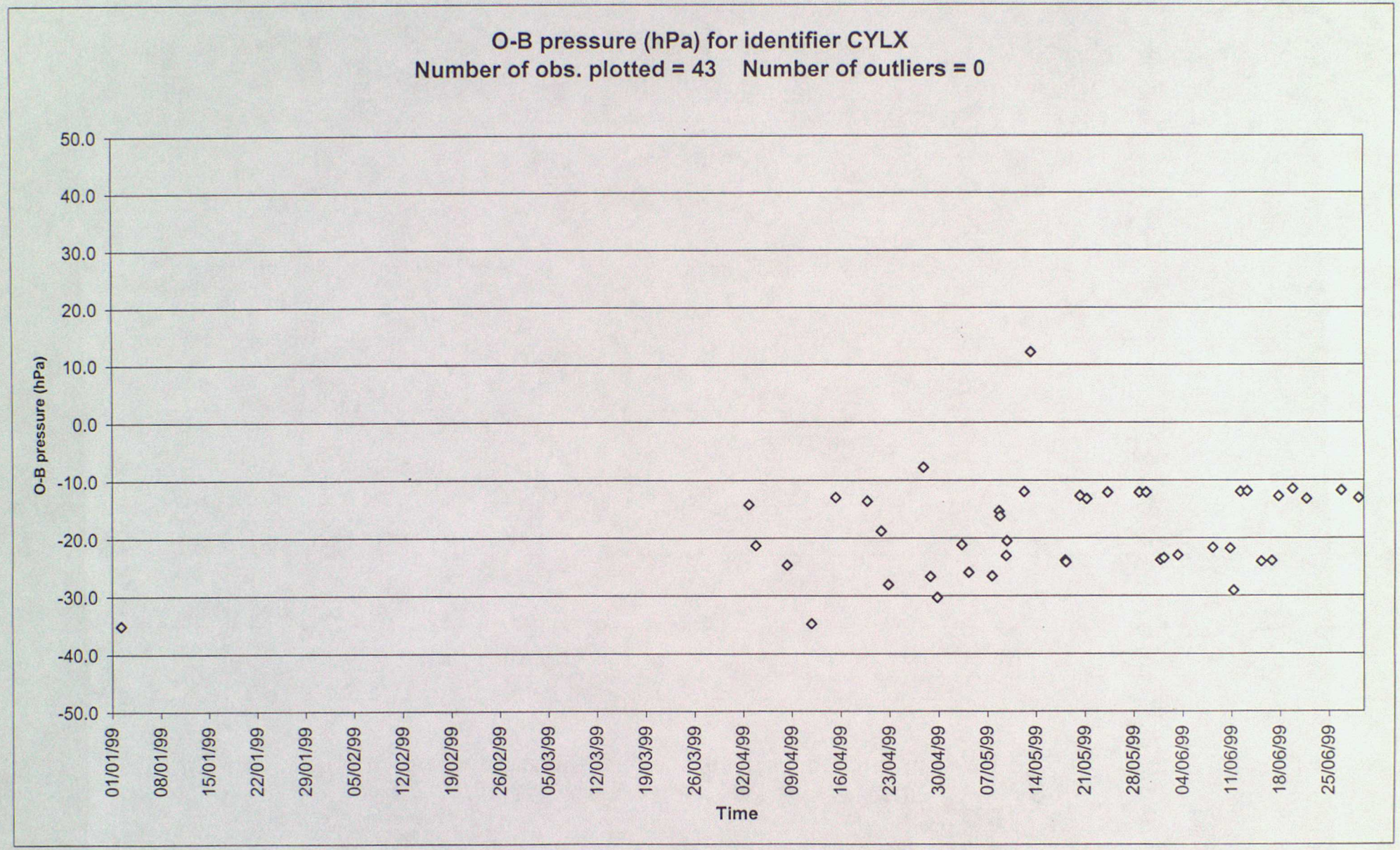

O-B pressure (hPa) for identifier 64691
Number of obs. plotted = 958 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

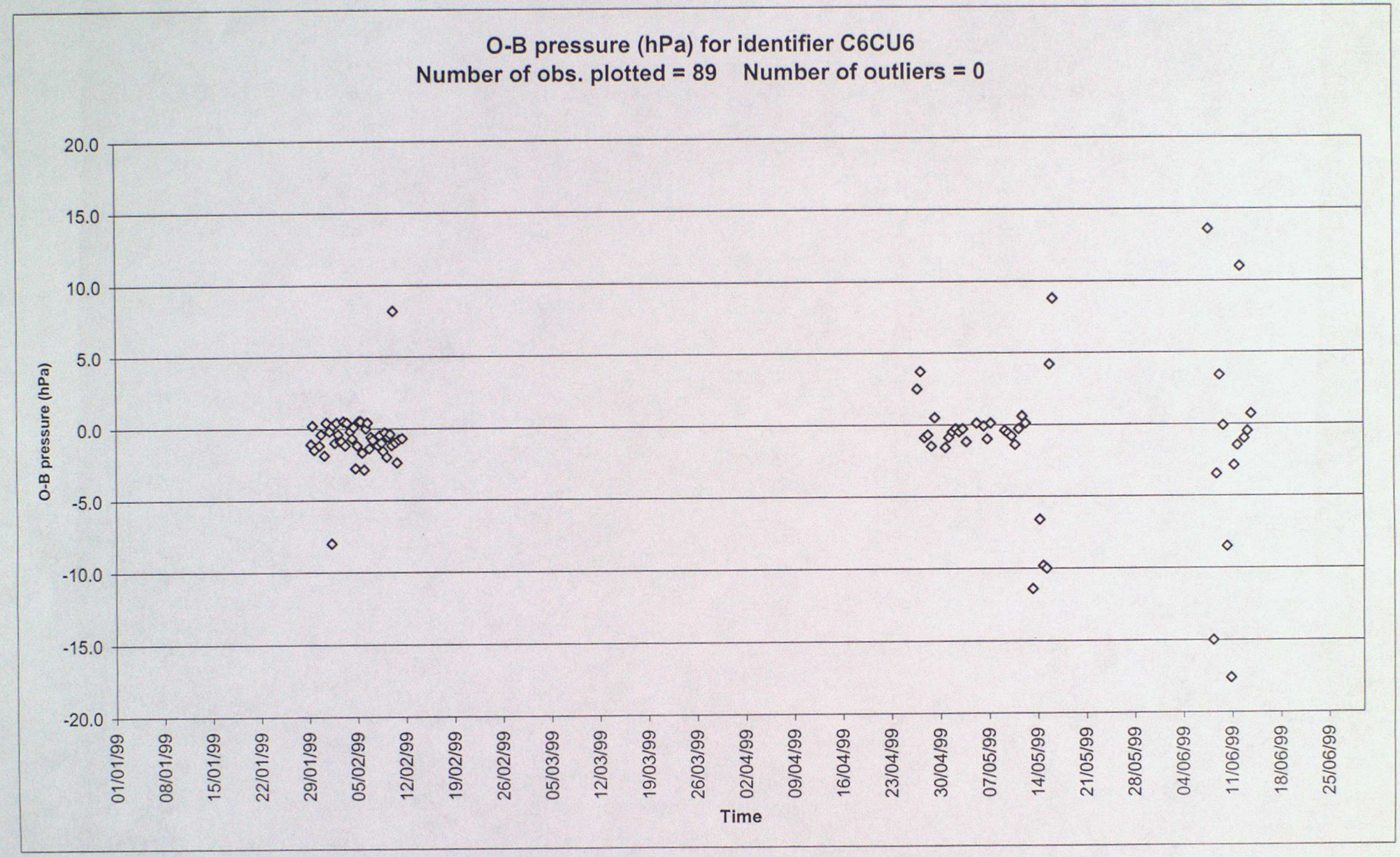

O-B pressure (hPa) for identifier 65592
Number of obs. plotted = 3960 Number of outliers = 14
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

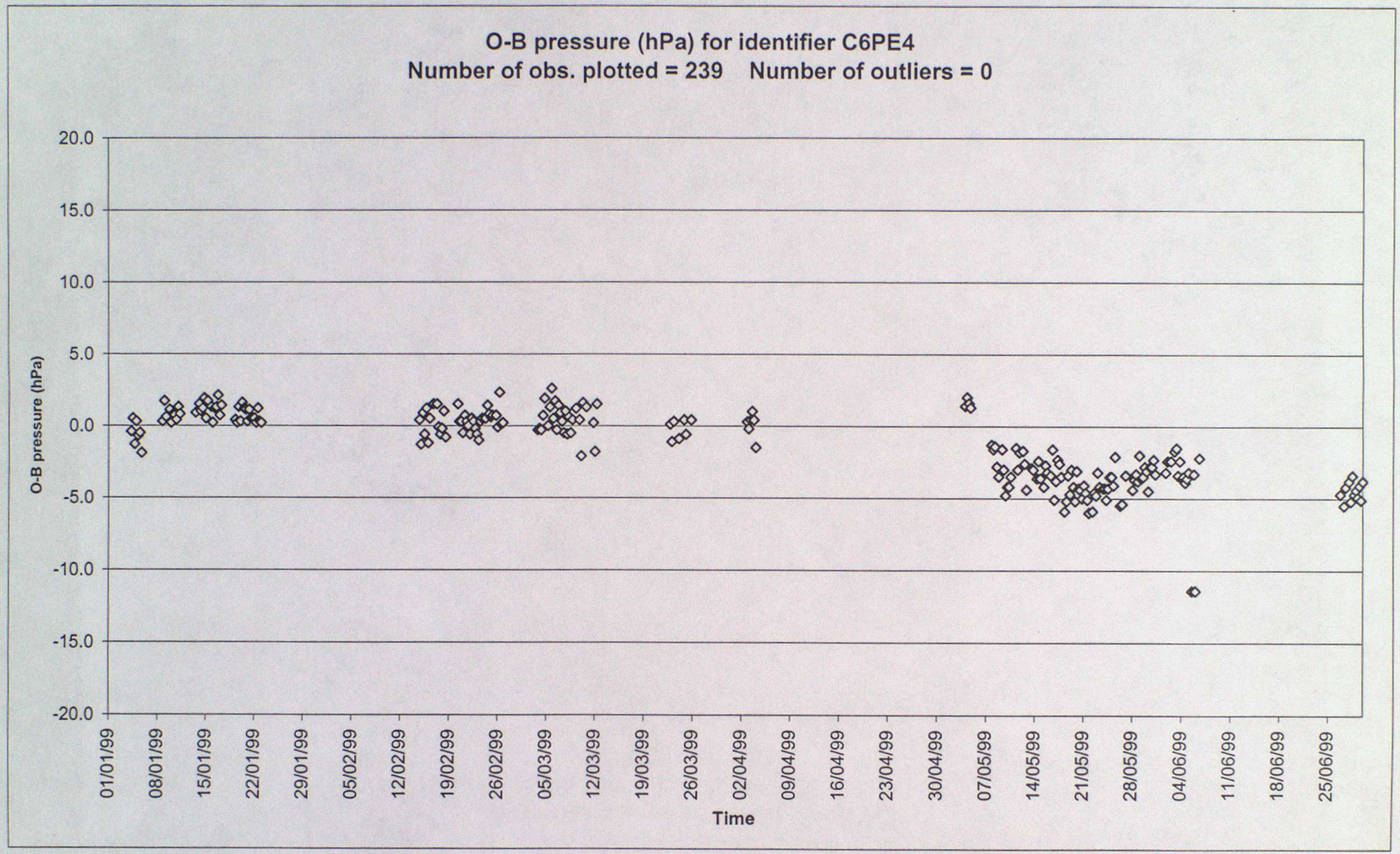

O-B pressure (hPa) for identifier 71548
Number of obs. plotted = 32 Number of outliers = 19
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

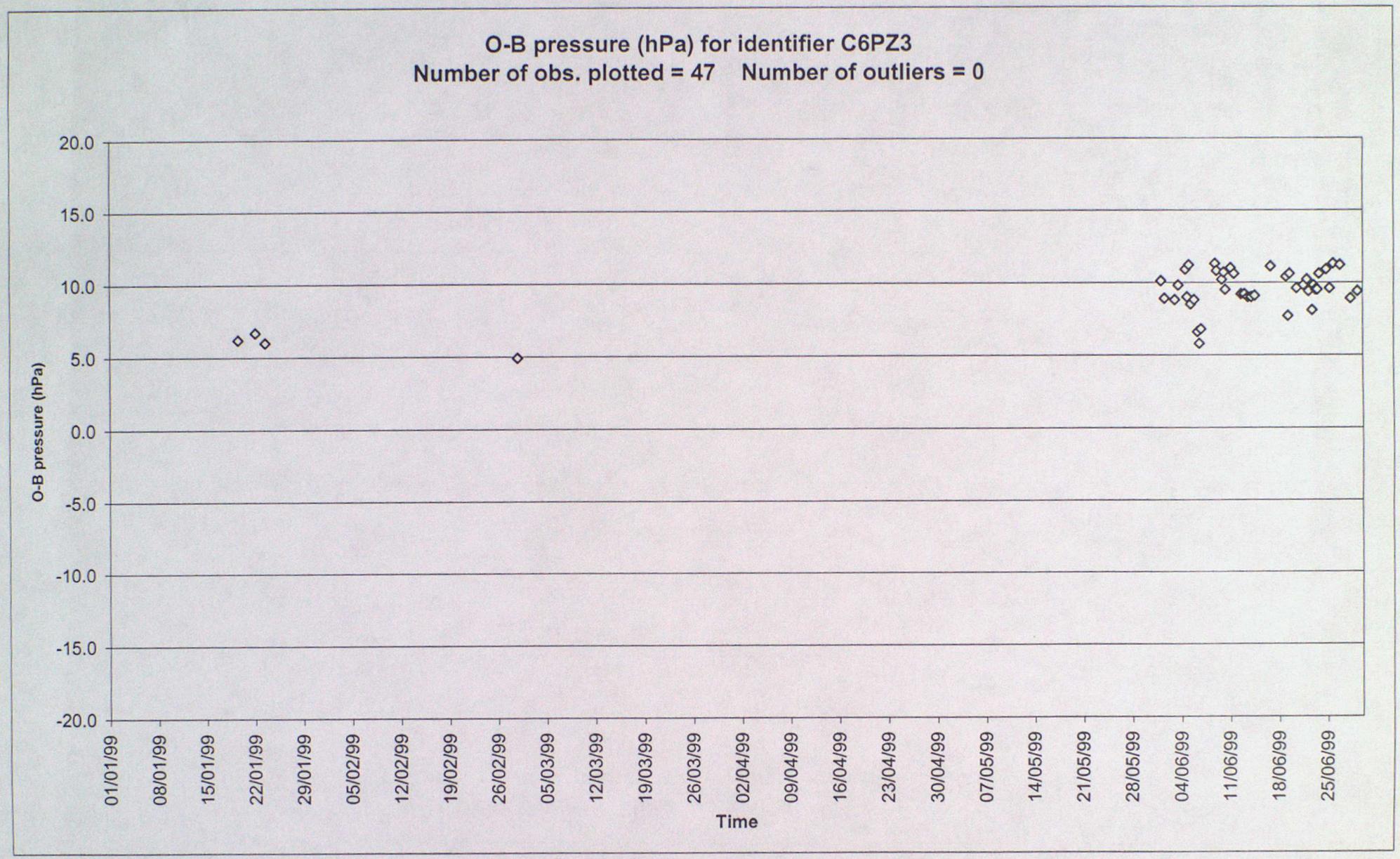

O-B pressure (hPa) for identifier 71556
Number of obs. plotted = 1529 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

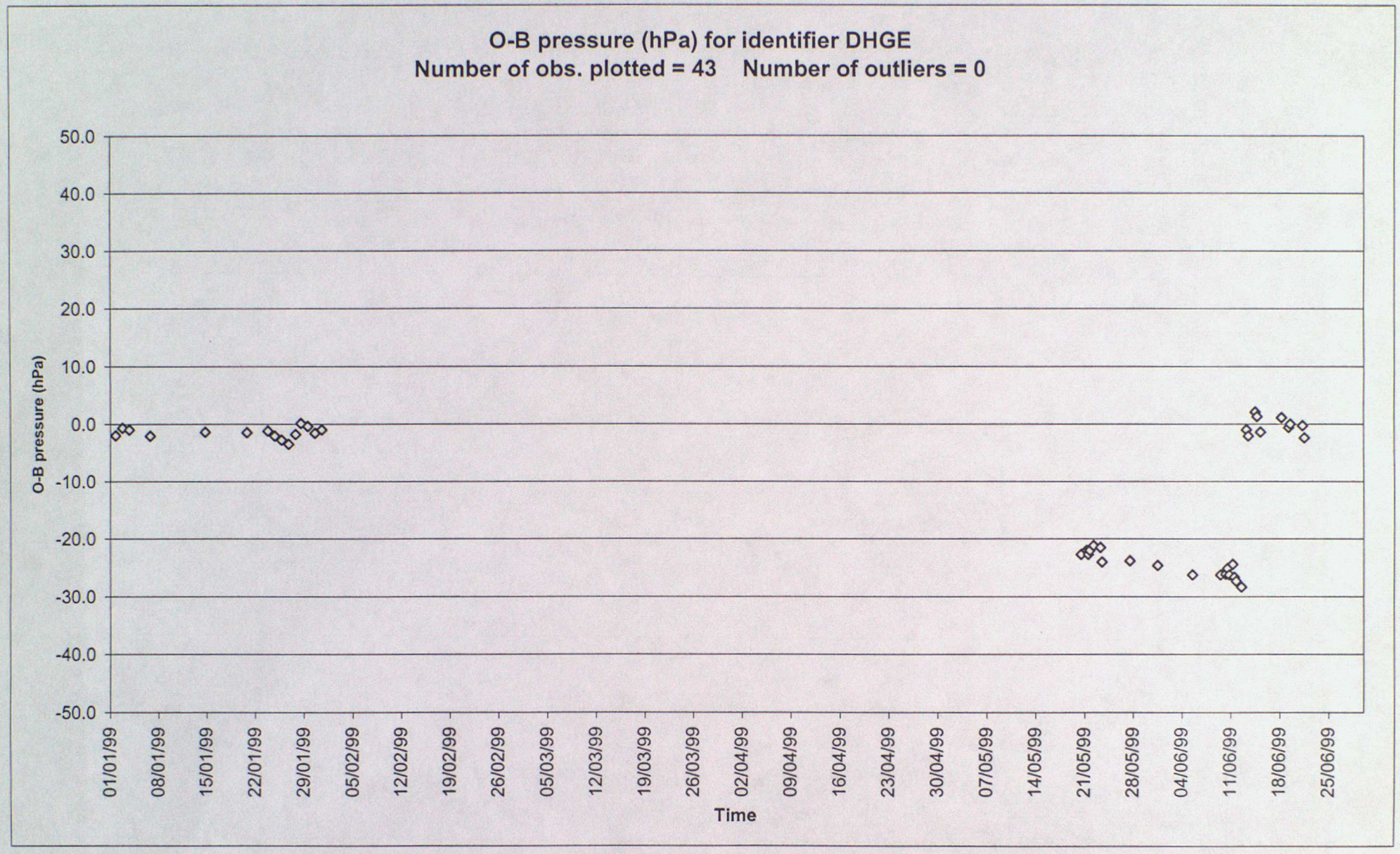

O-B pressure (hPa) for identifier AGRF
Number of obs. plotted = 47 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

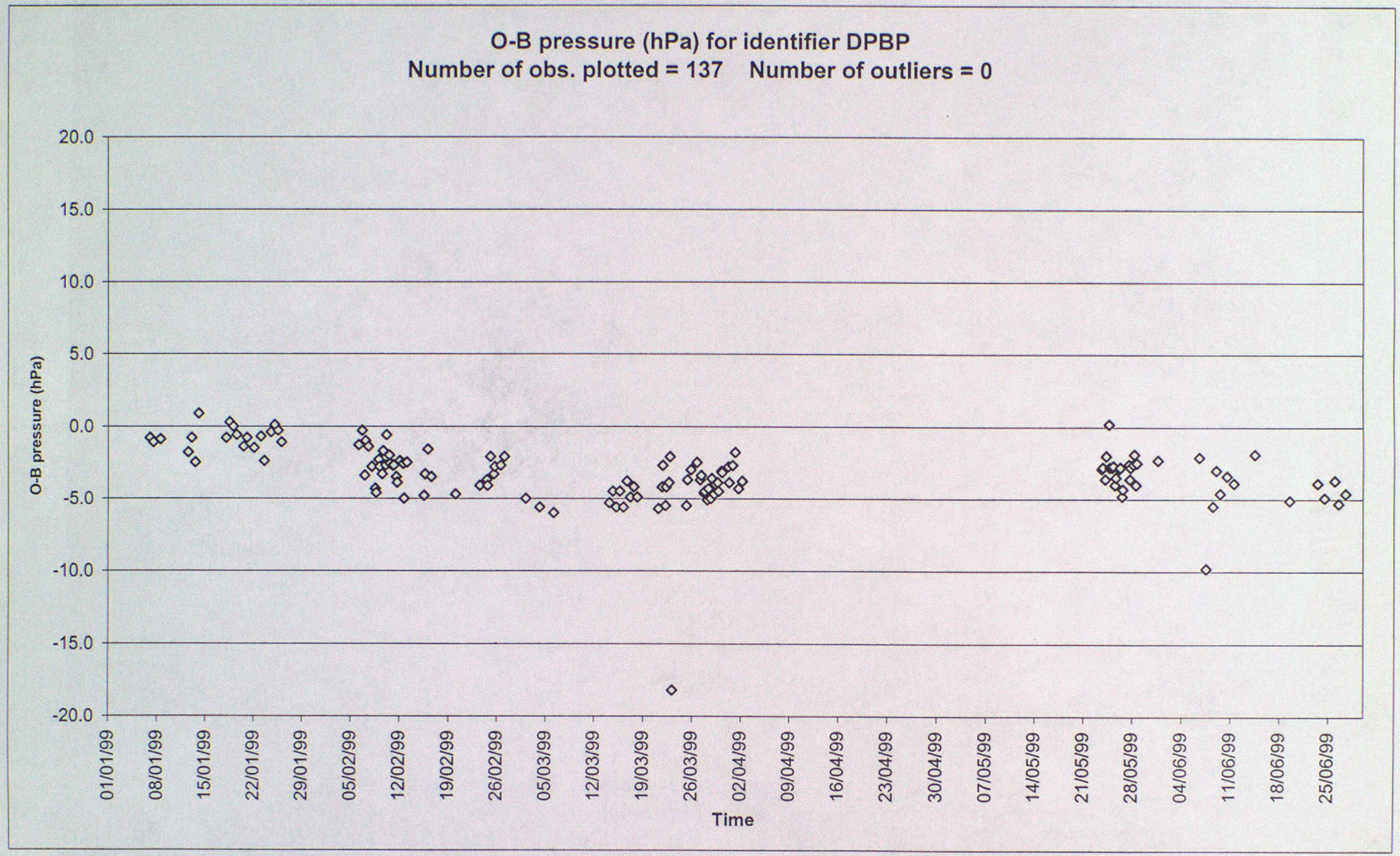

O-B pressure (hPa) for identifier CYLX
Number of obs. plotted = 43 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

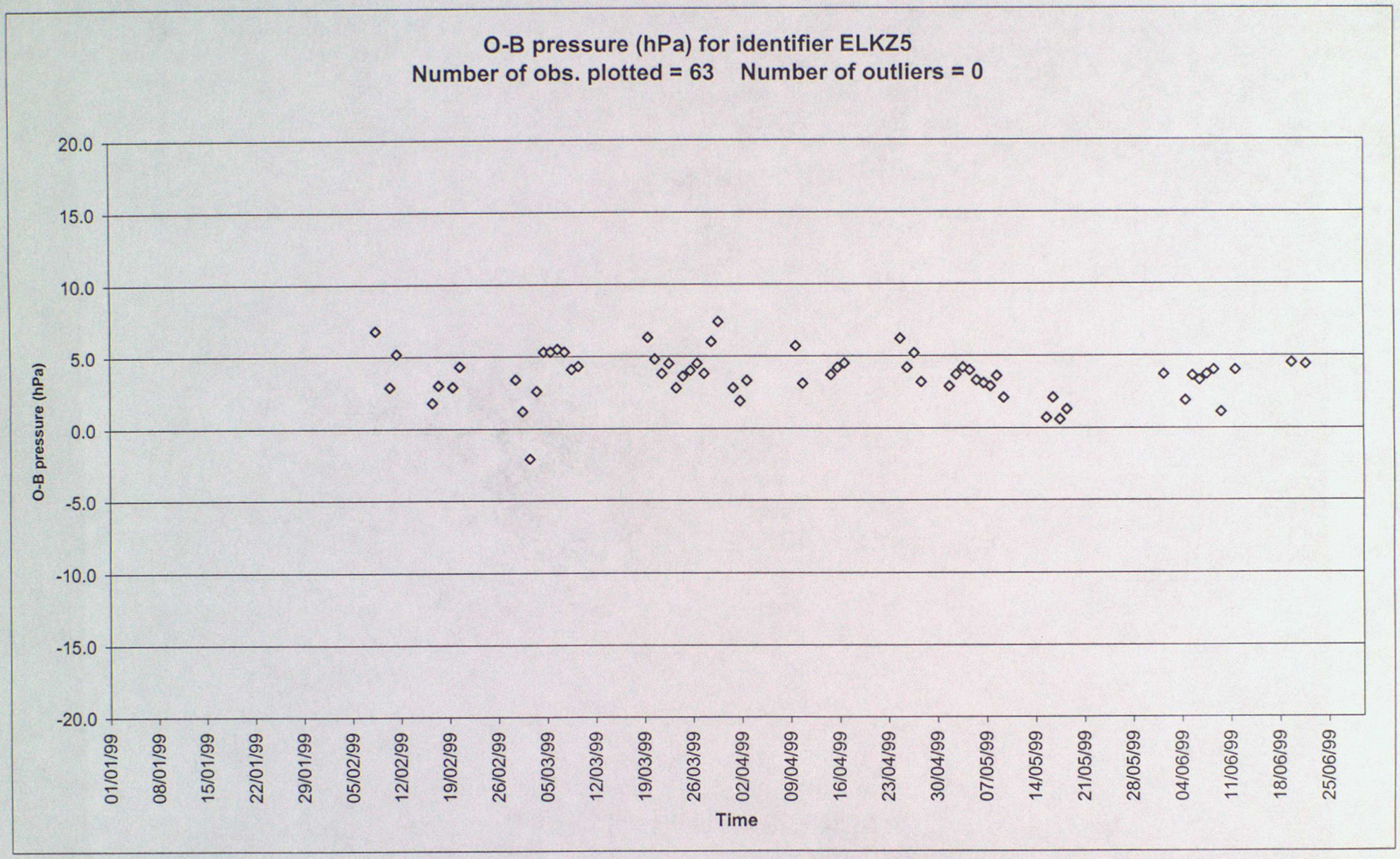

O-B pressure (hPa) for identifier C6CU6
Number of obs. plotted = 89 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

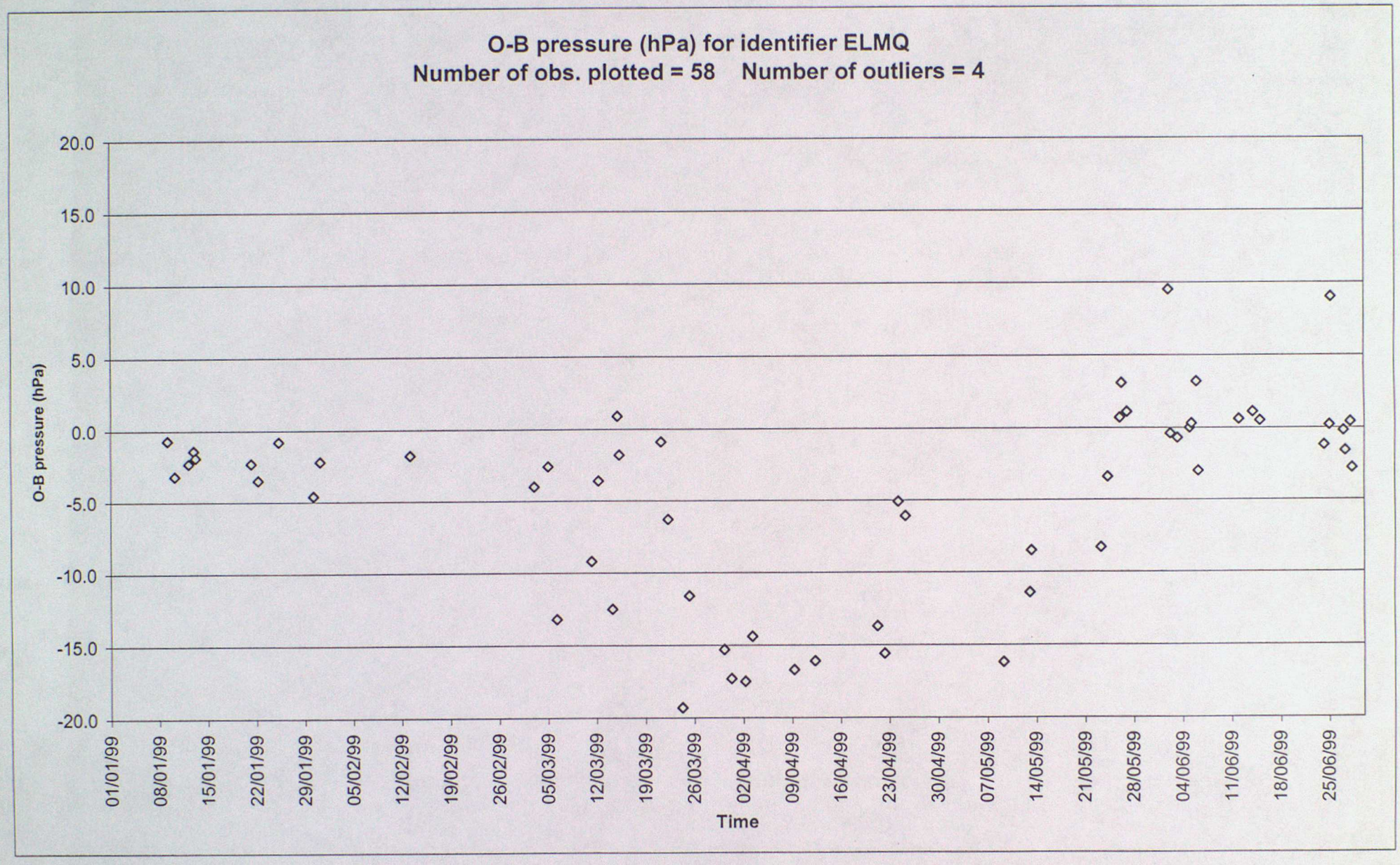

O-B pressure (hPa) for identifier C6PE4
Number of obs. plotted = 239 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

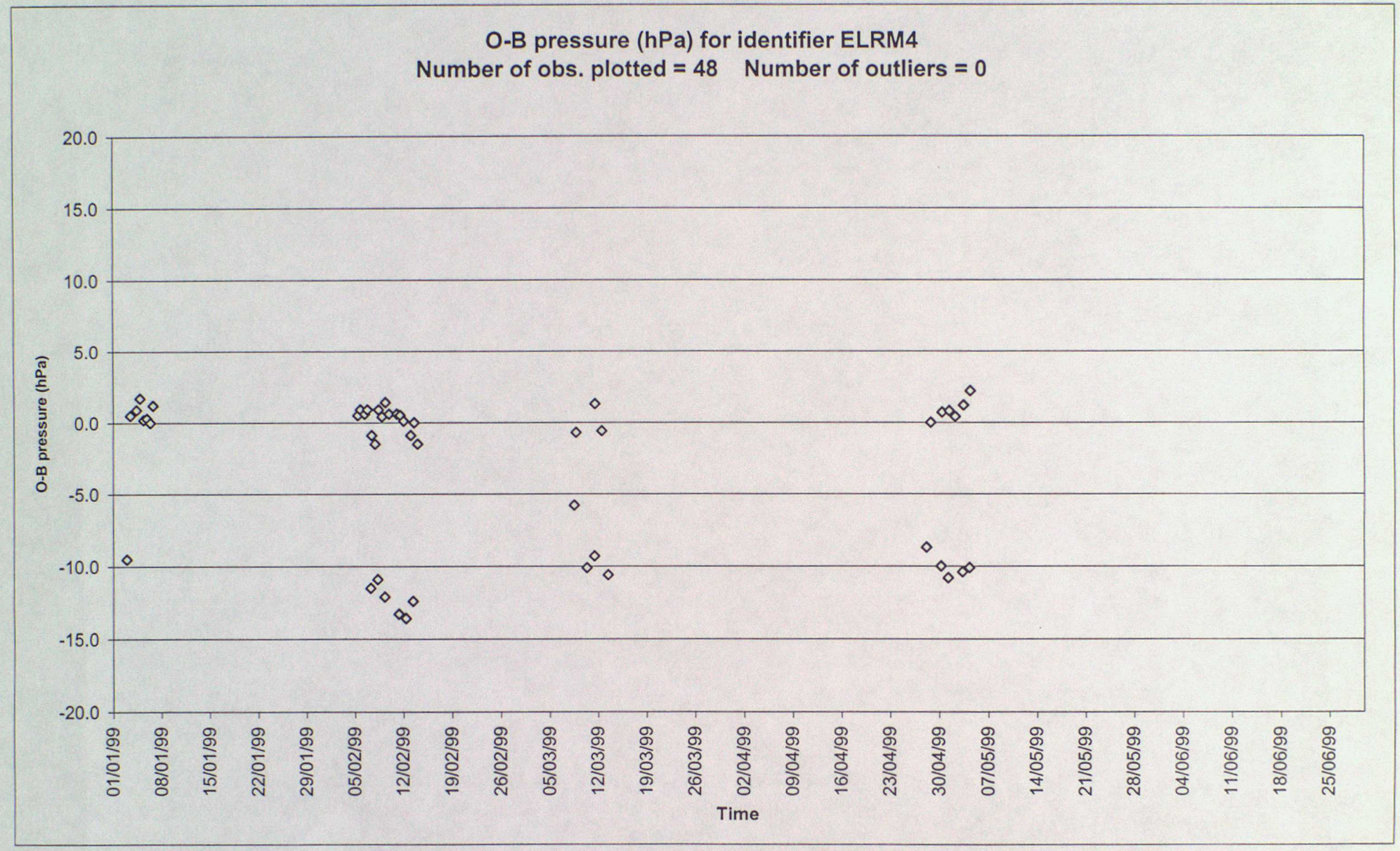

O-B pressure (hPa) for identifier C6PZ3
Number of obs. plotted = 47 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

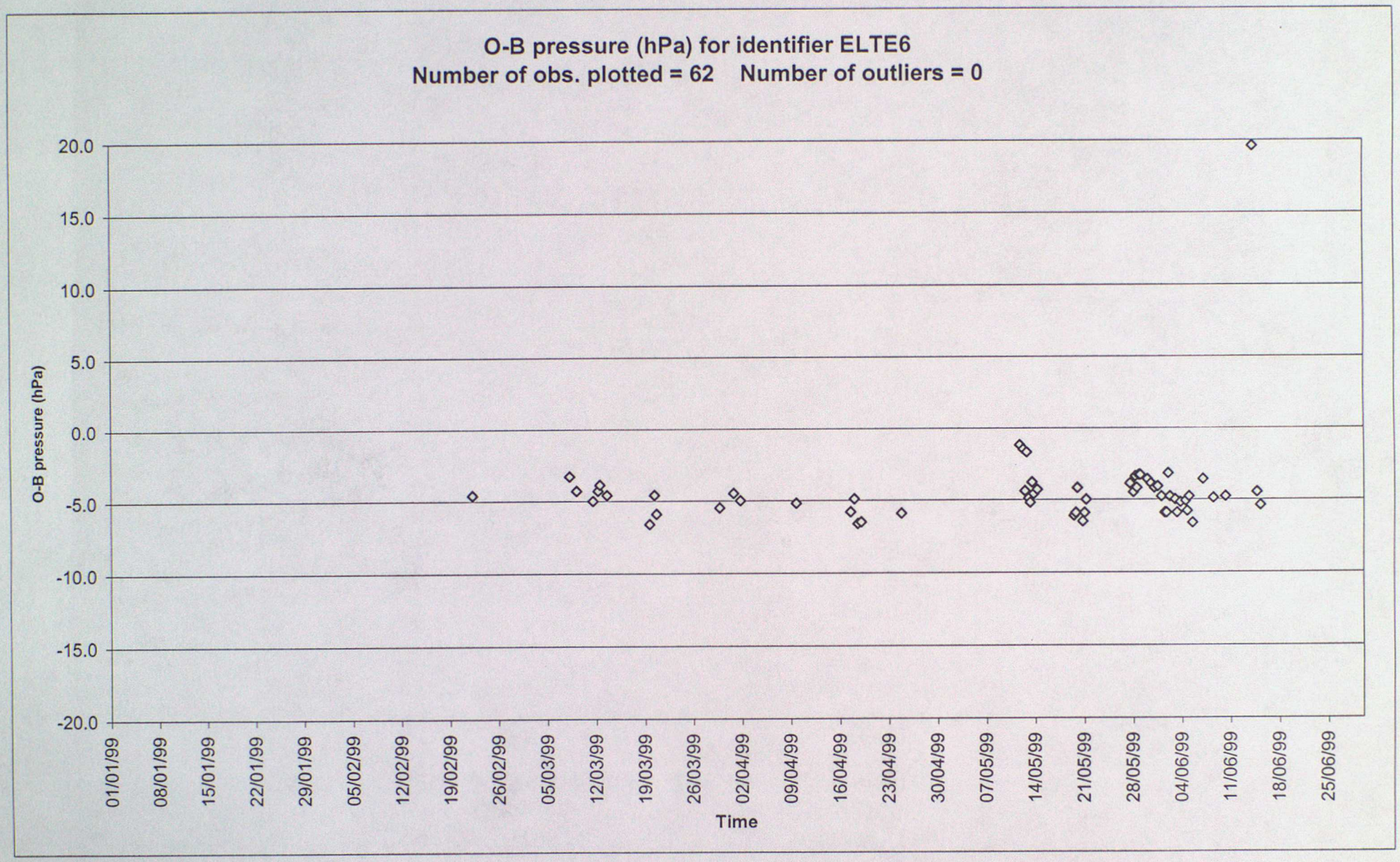

O-B pressure (hPa) for identifier DHGE
Number of obs. plotted = 43 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

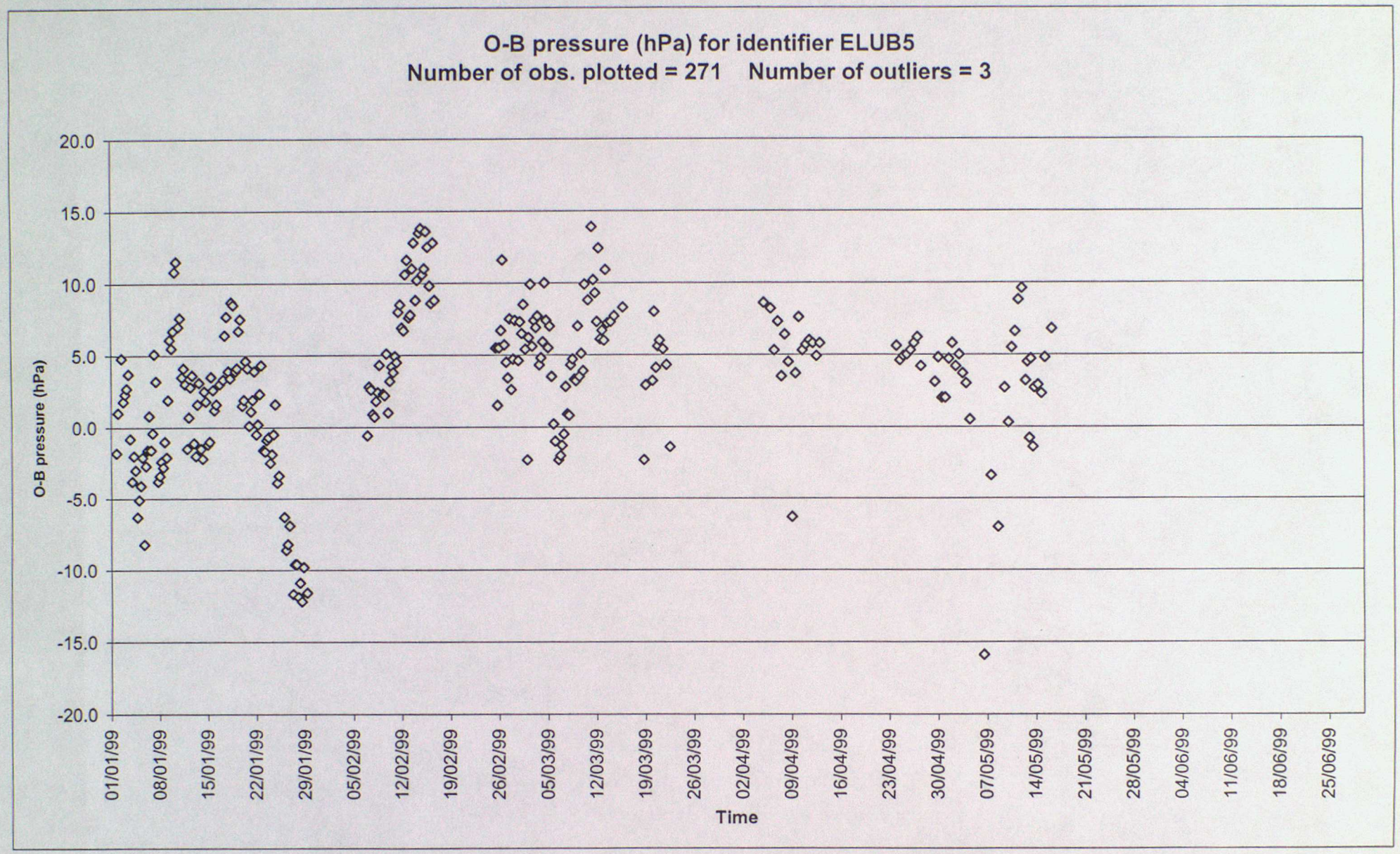

O-B pressure (hPa) for identifier DPBP
Number of obs. plotted = 137 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

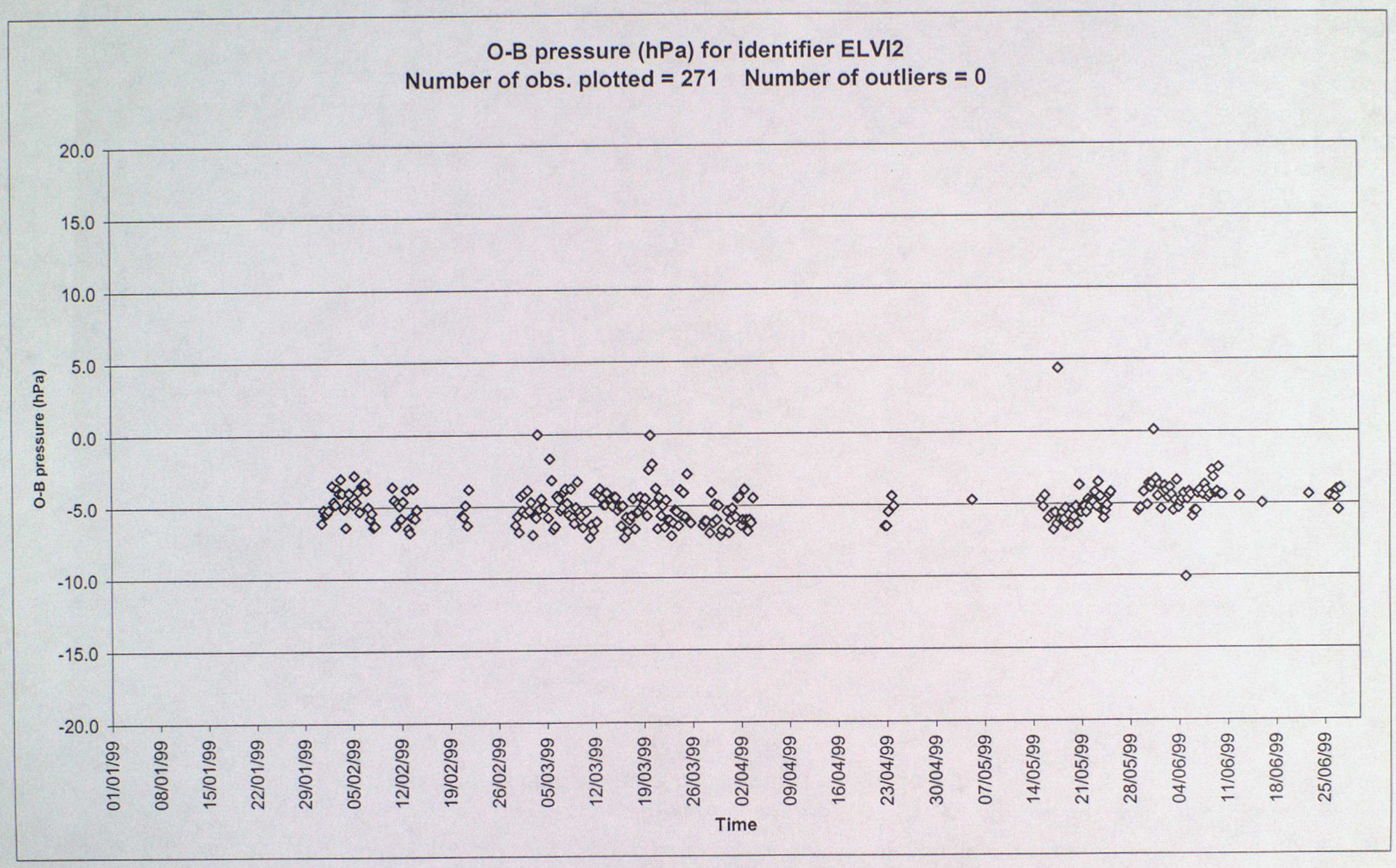

O-B pressure (hPa) for identifier ELKZ5
Number of obs. plotted = 63 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

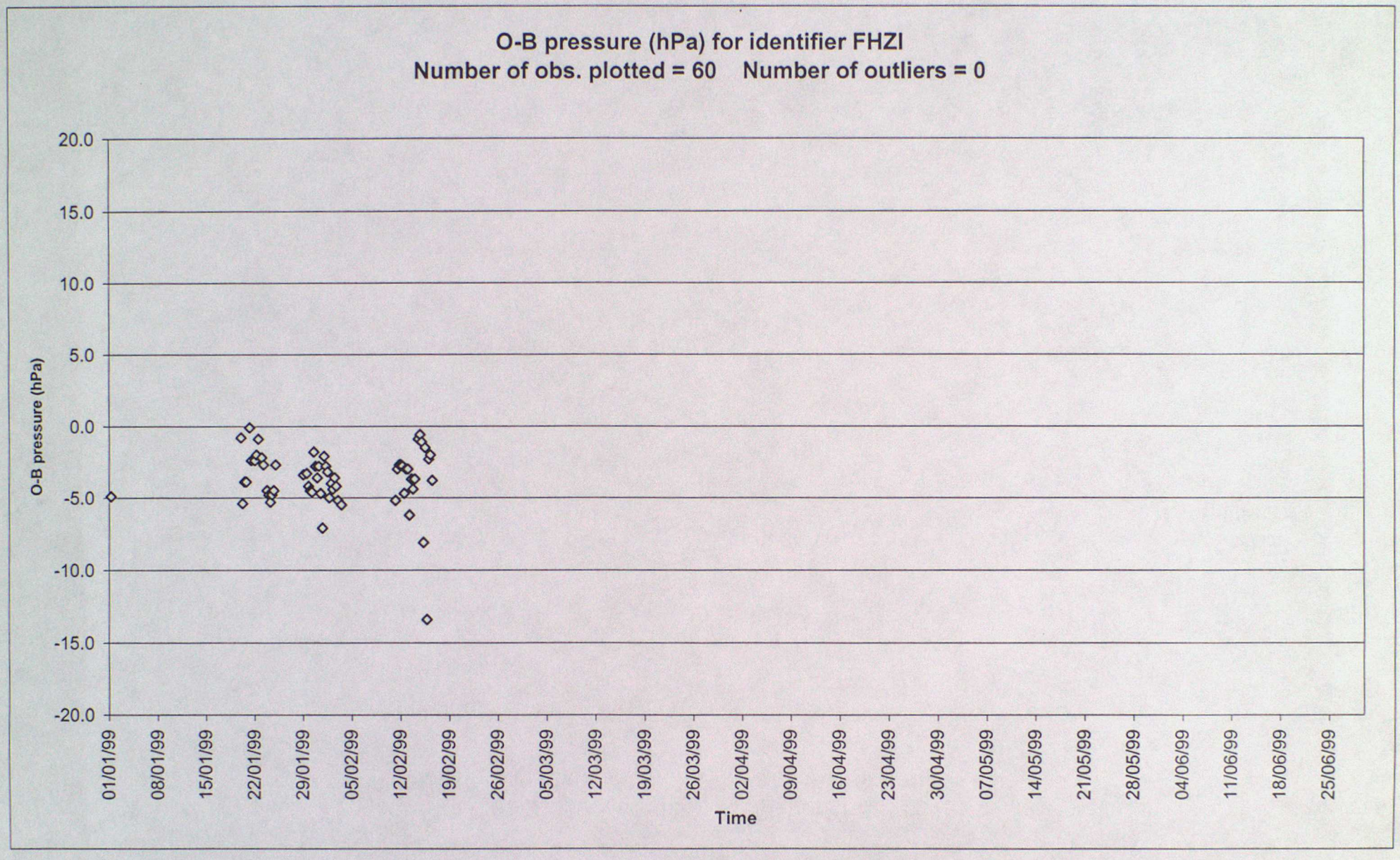

O-B pressure (hPa) for identifier ELMQ
Number of obs. plotted = 58 Number of outliers = 4
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

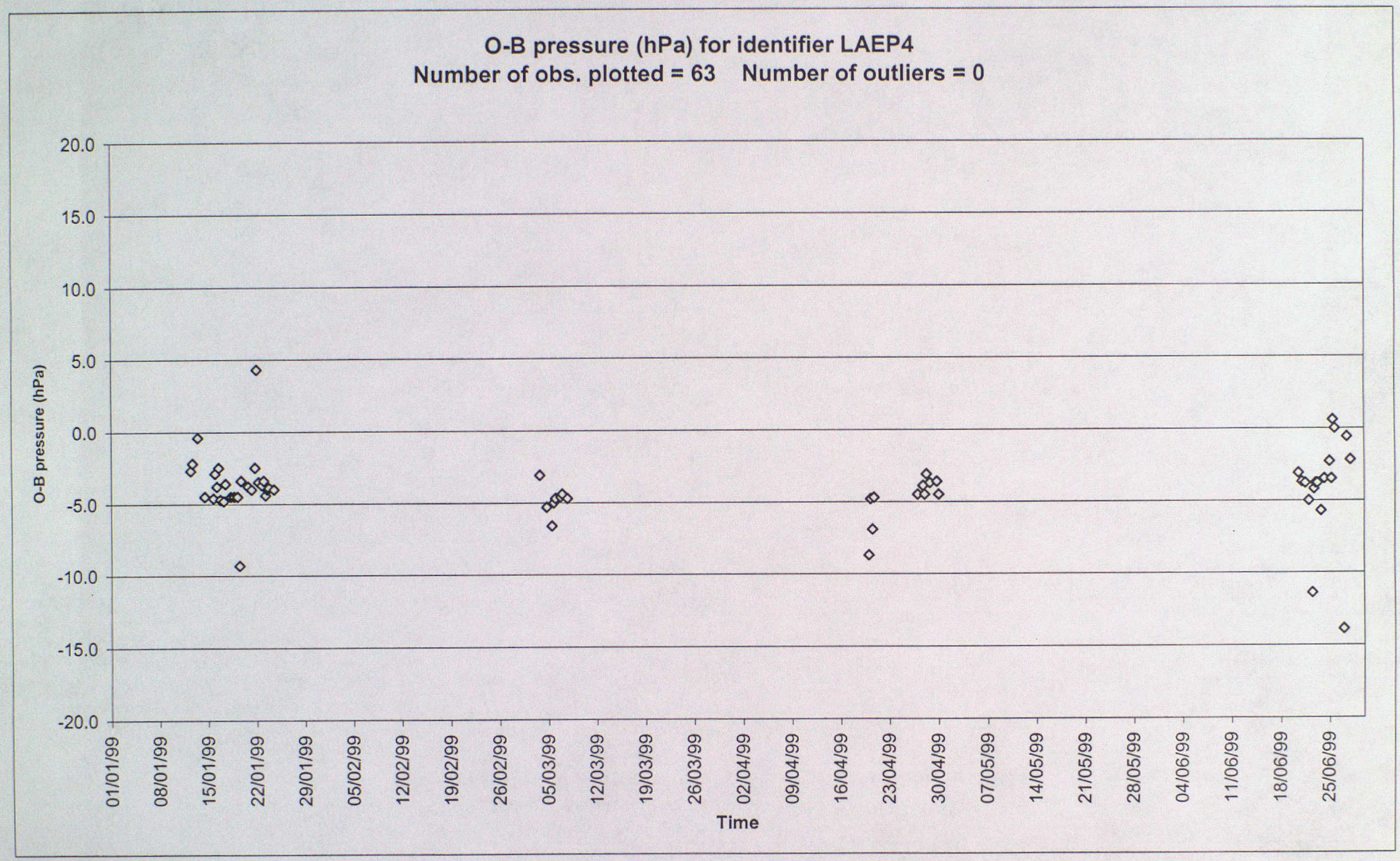

O-B pressure (hPa) for identifier ELRM4
Number of obs. plotted = 48 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

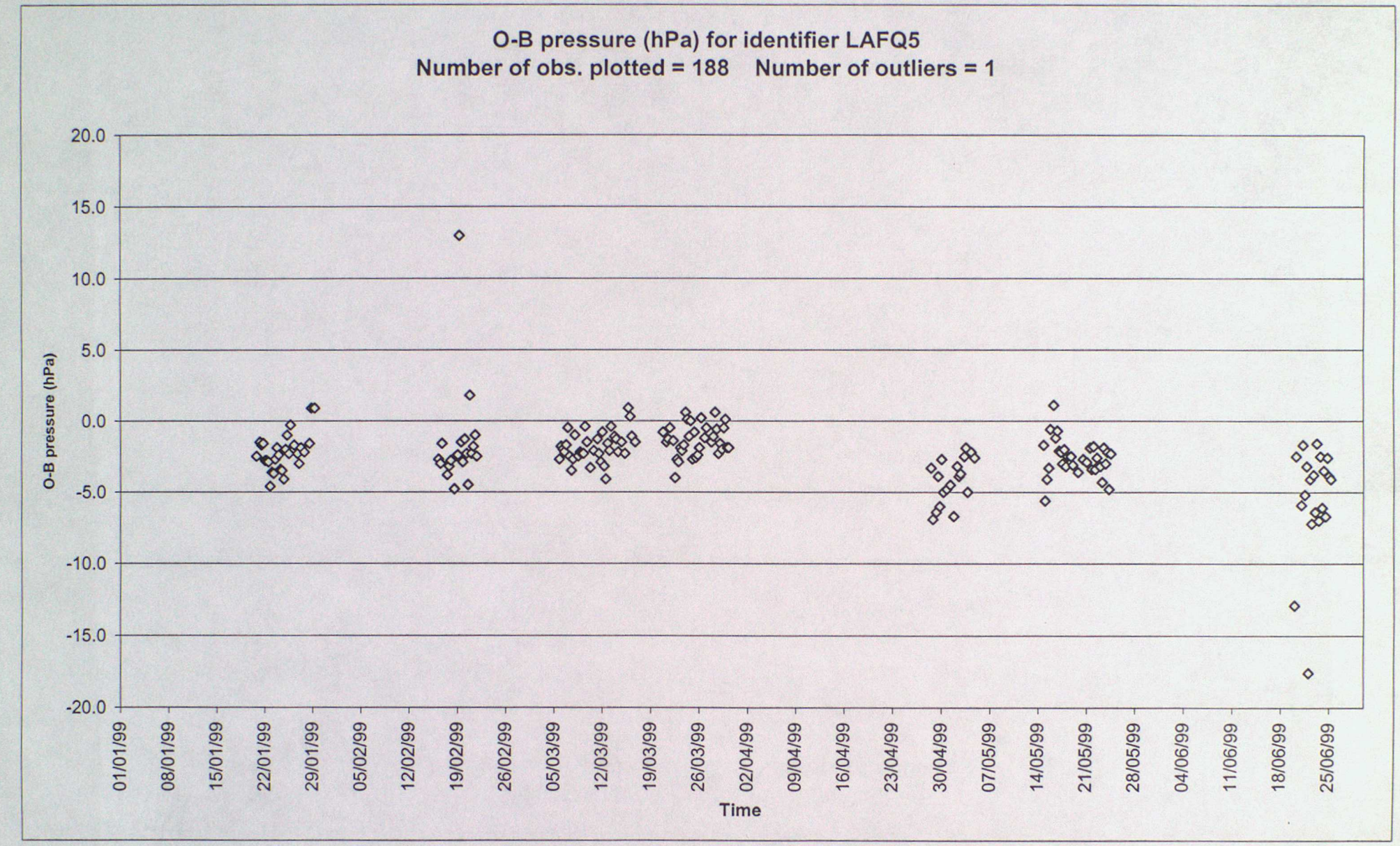

O-B pressure (hPa) for identifier ELTE6
Number of obs. plotted = 62 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

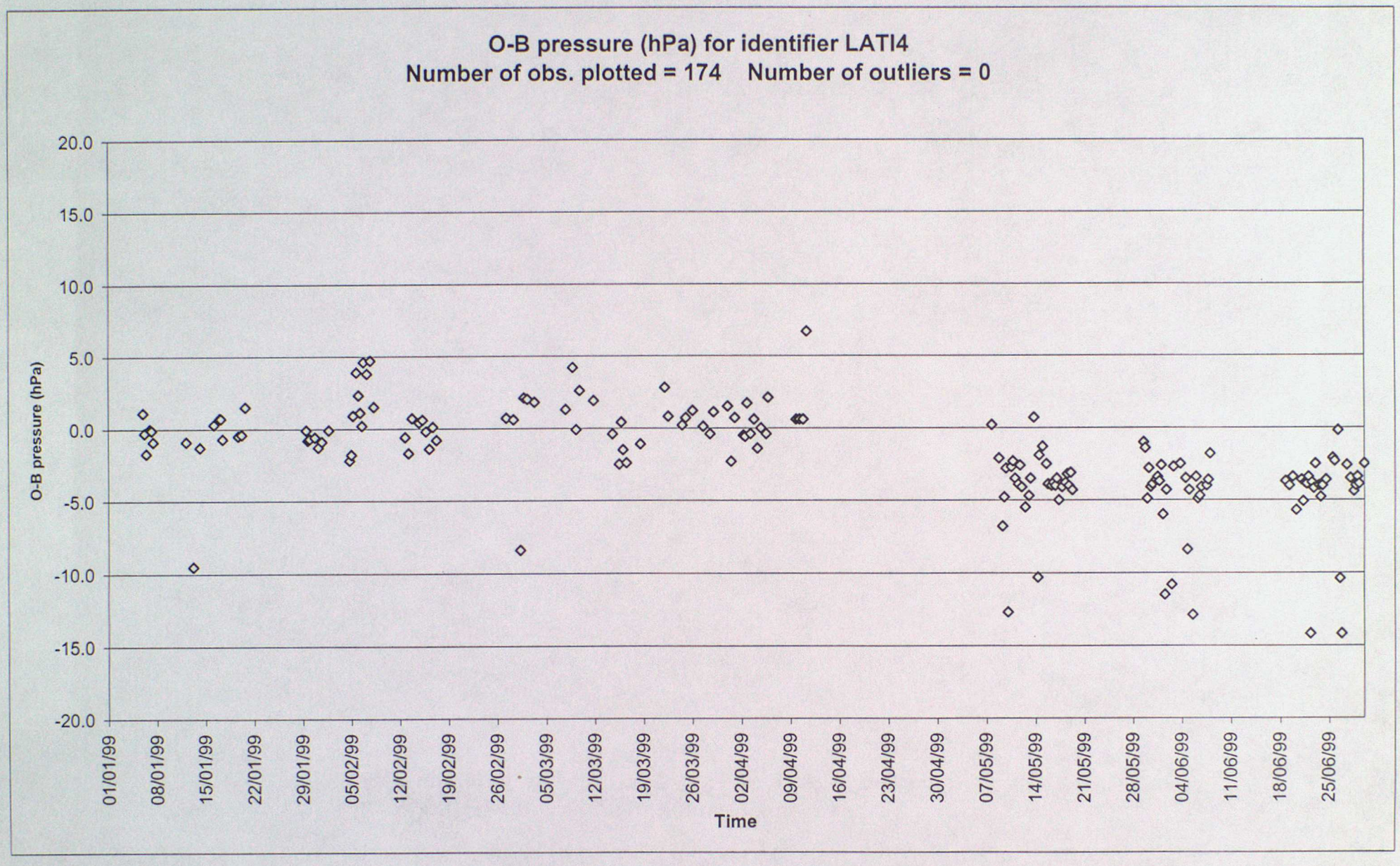

O-B pressure (hPa) for identifier ELUB5
Number of obs. plotted = 271 Number of outliers = 3
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

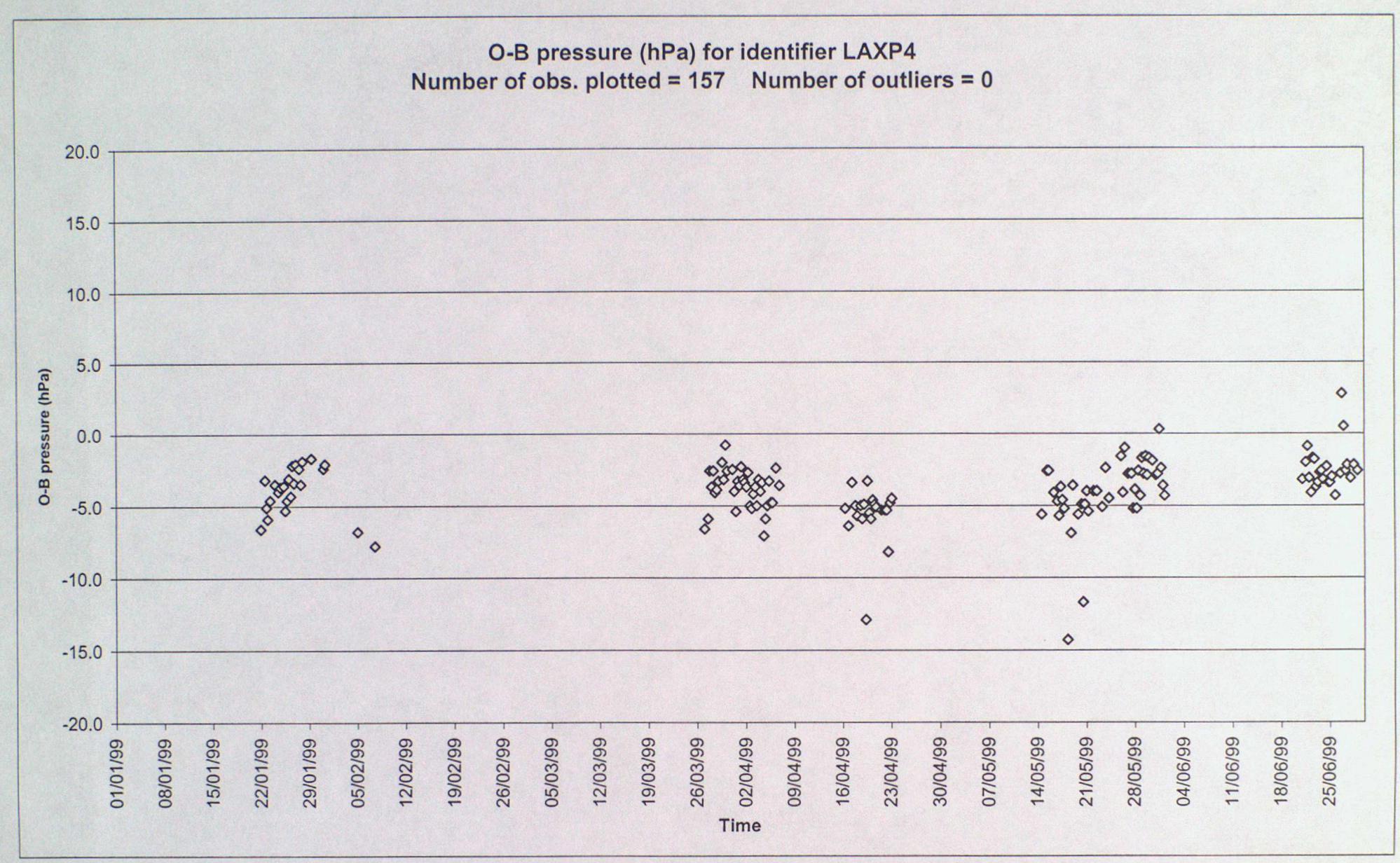

O-B pressure (hPa) for identifier ELVI2
Number of obs. plotted = 271 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier FHZI
Number of obs. plotted = 60 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier LAEP4
Number of obs. plotted = 63 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier LAFQ5
Number of obs. plotted = 188 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier LATI4
Number of obs. plotted = 174 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier LAXP4
Number of obs. plotted = 157 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
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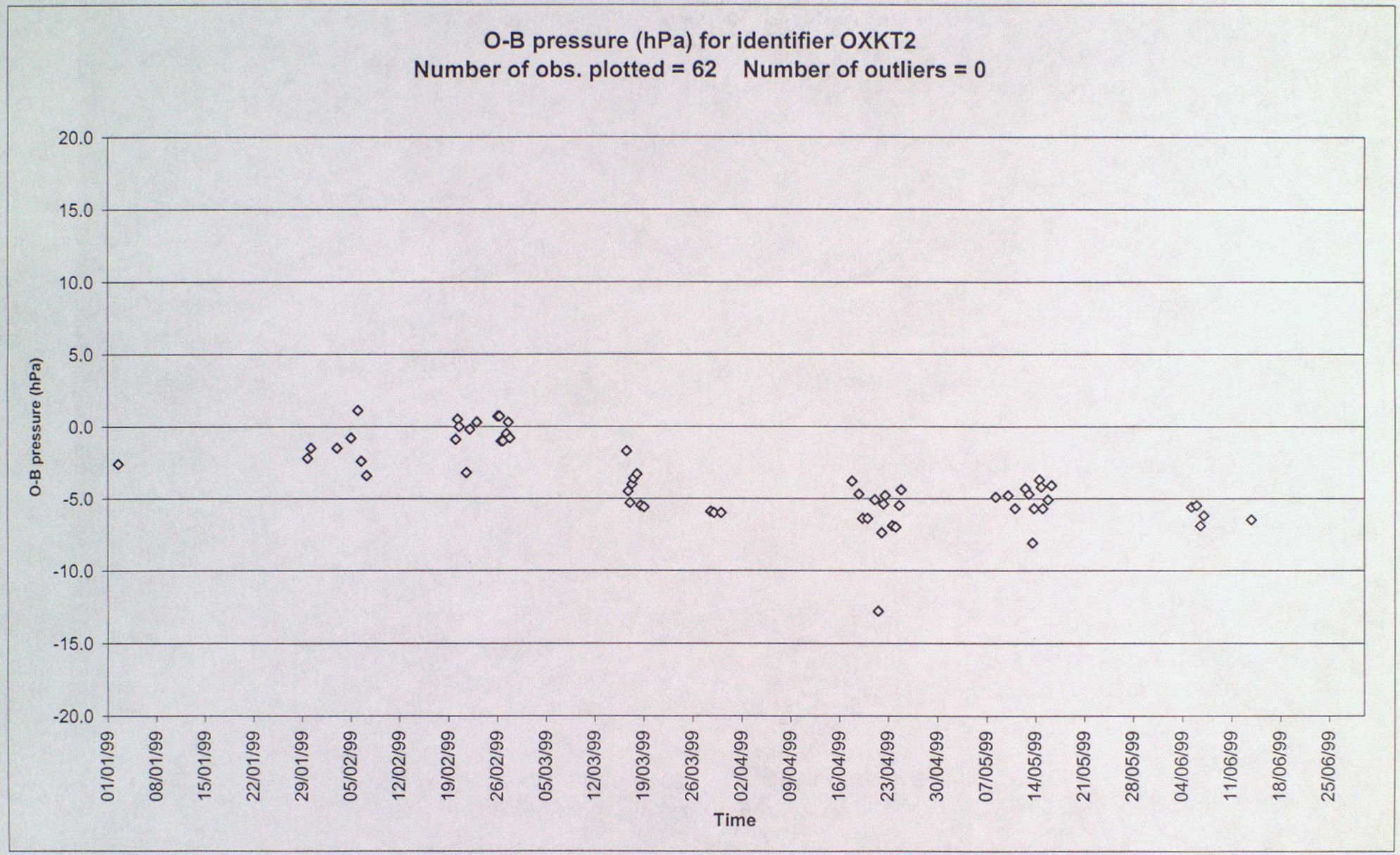
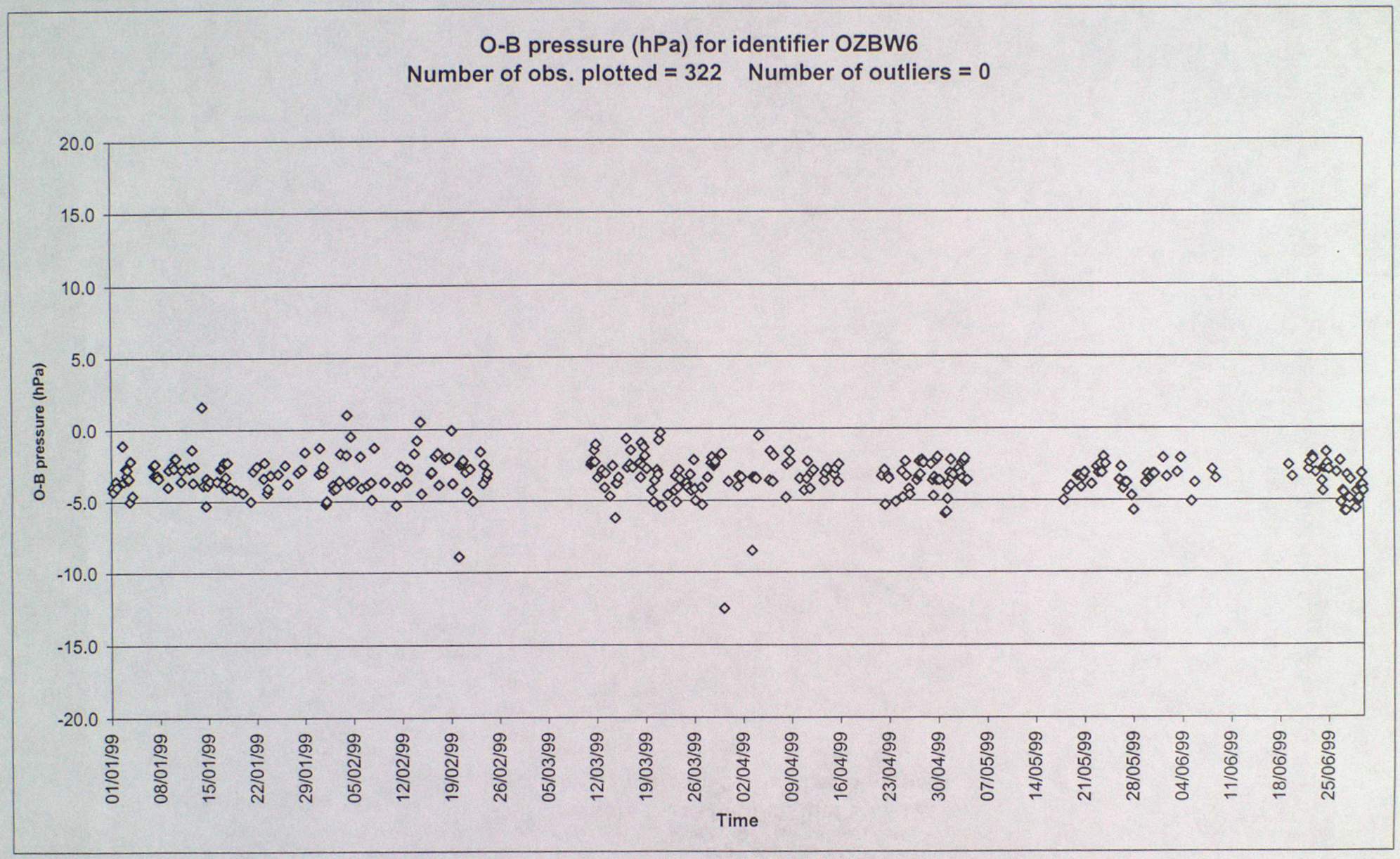
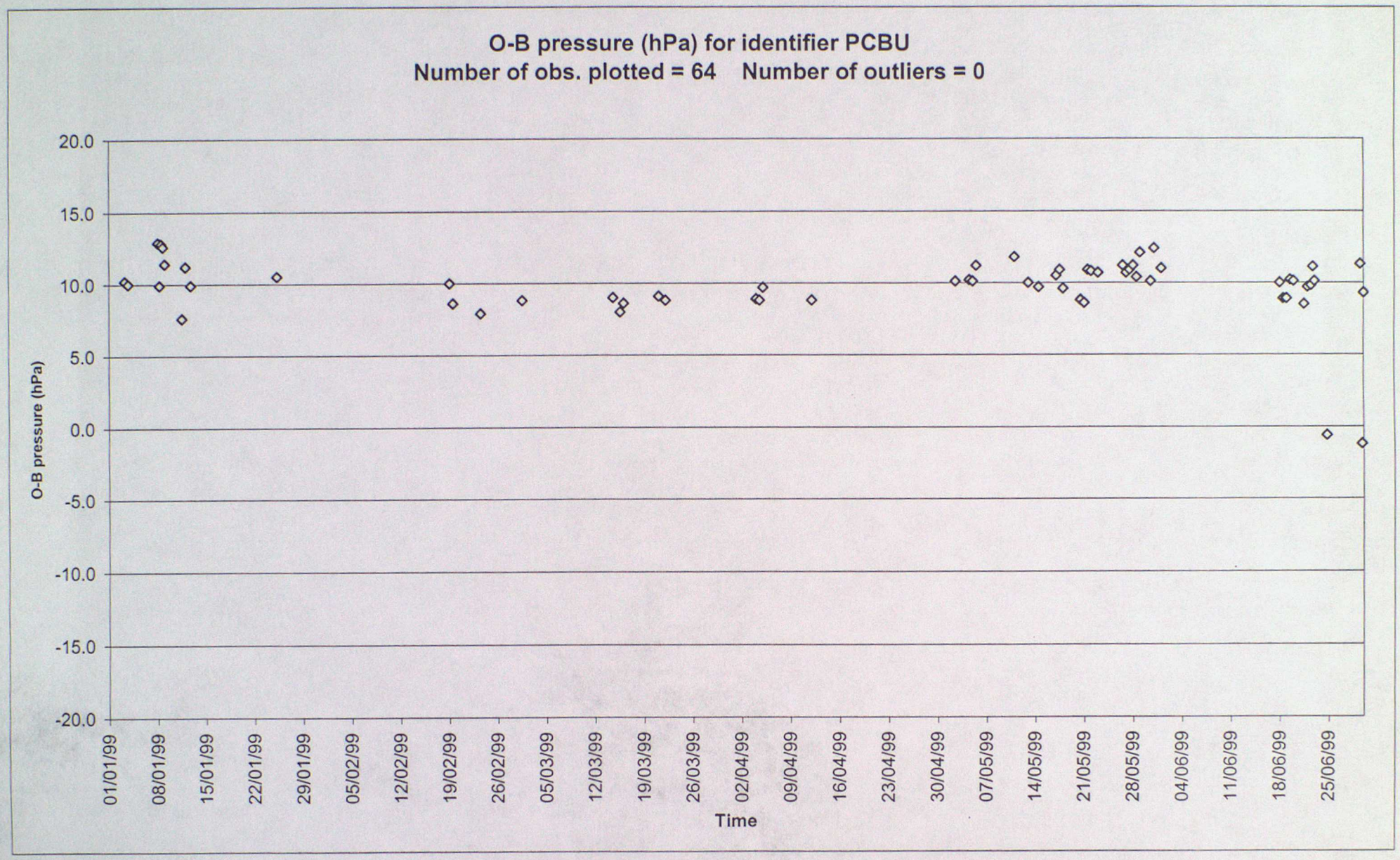
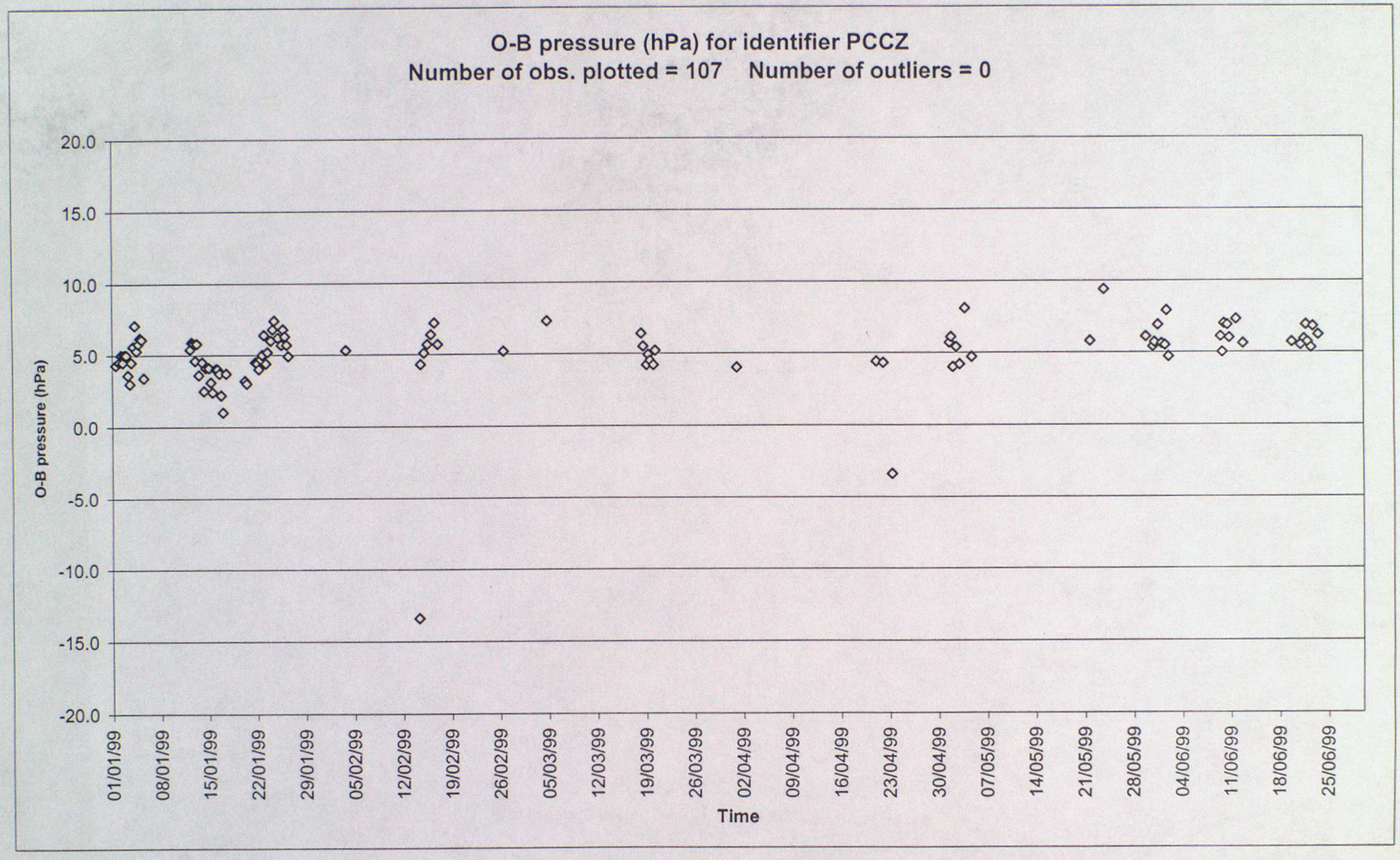
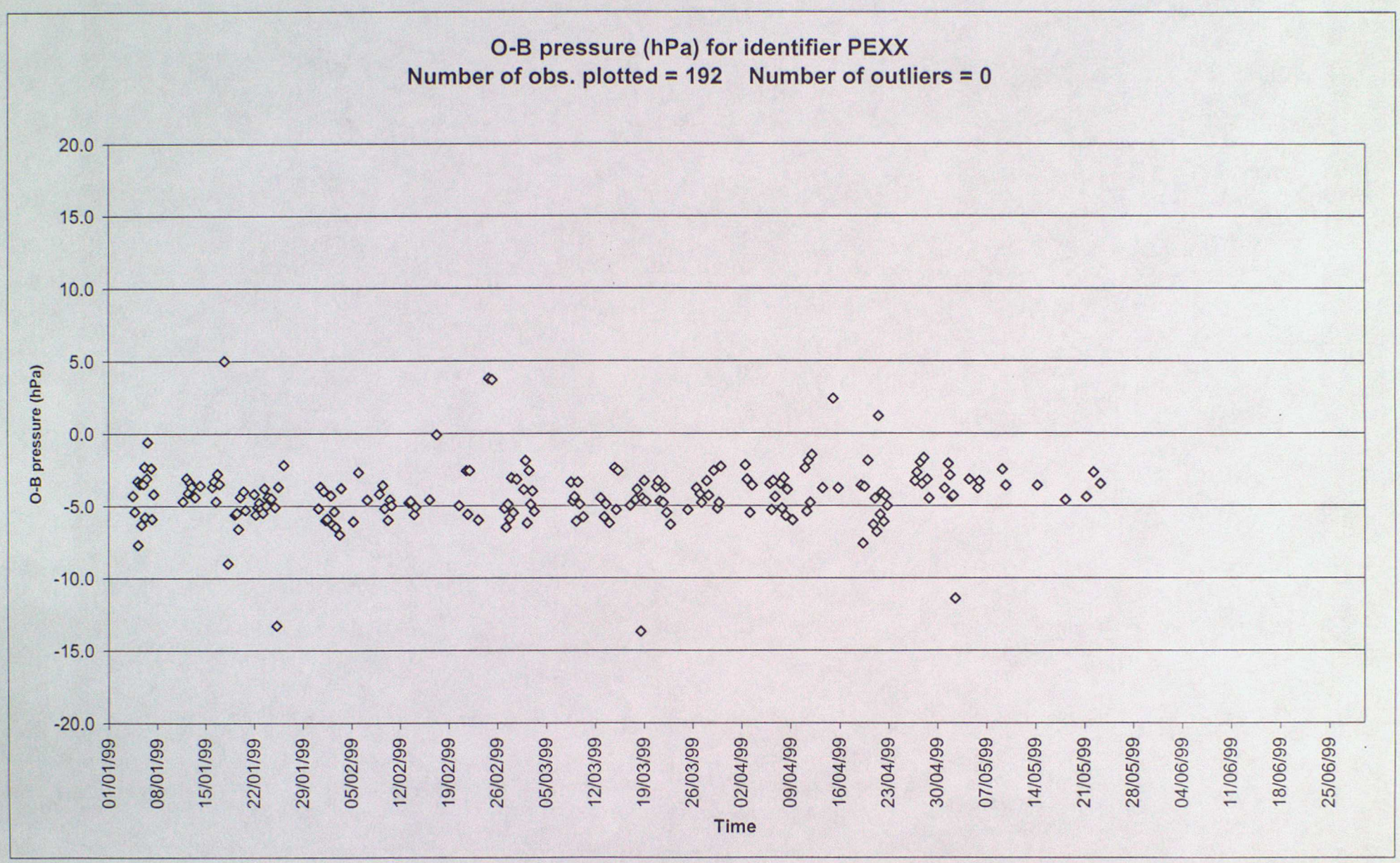
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

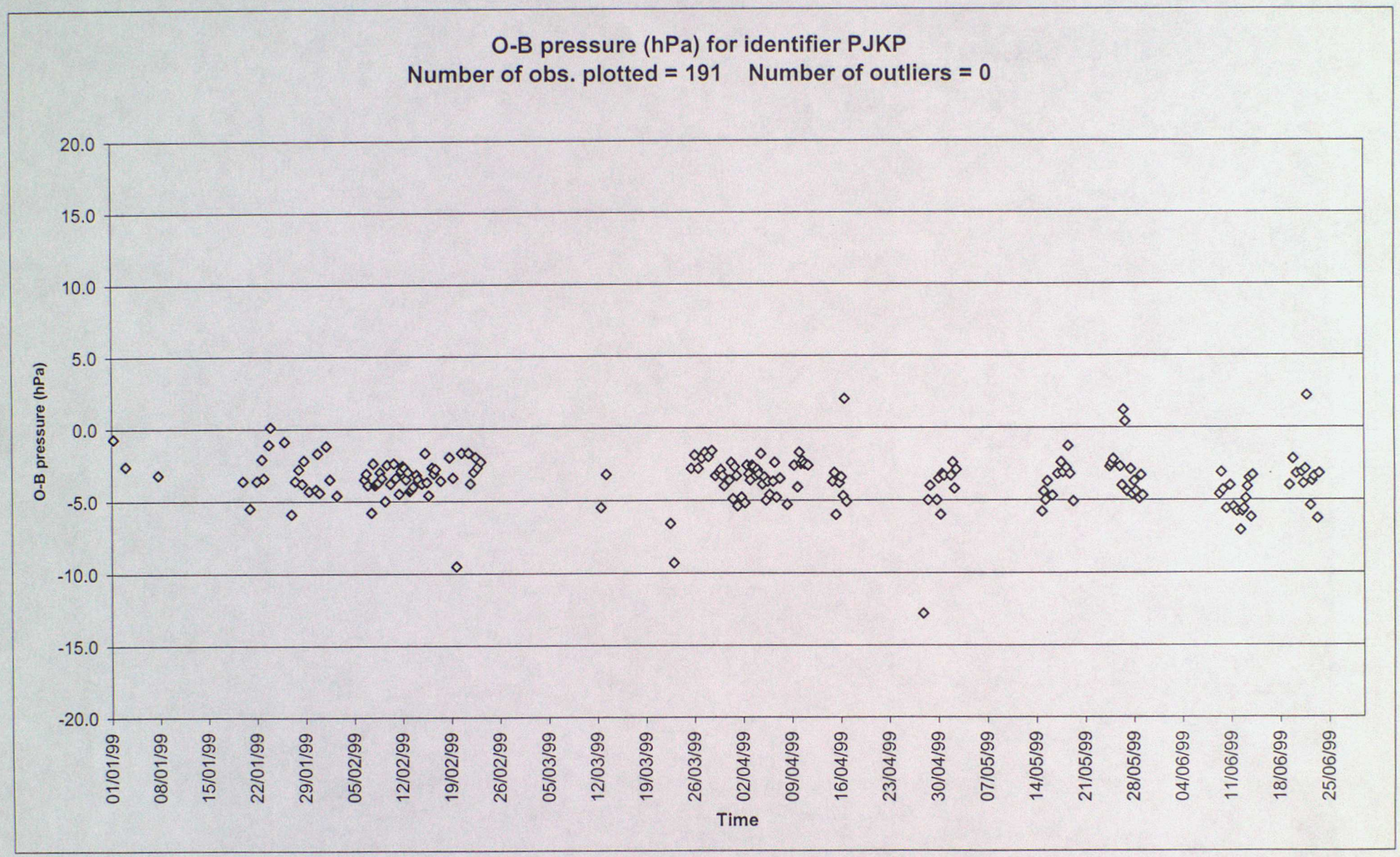

O-B pressure (hPa) for identifier OXKT2
Number of obs. plotted = 62 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

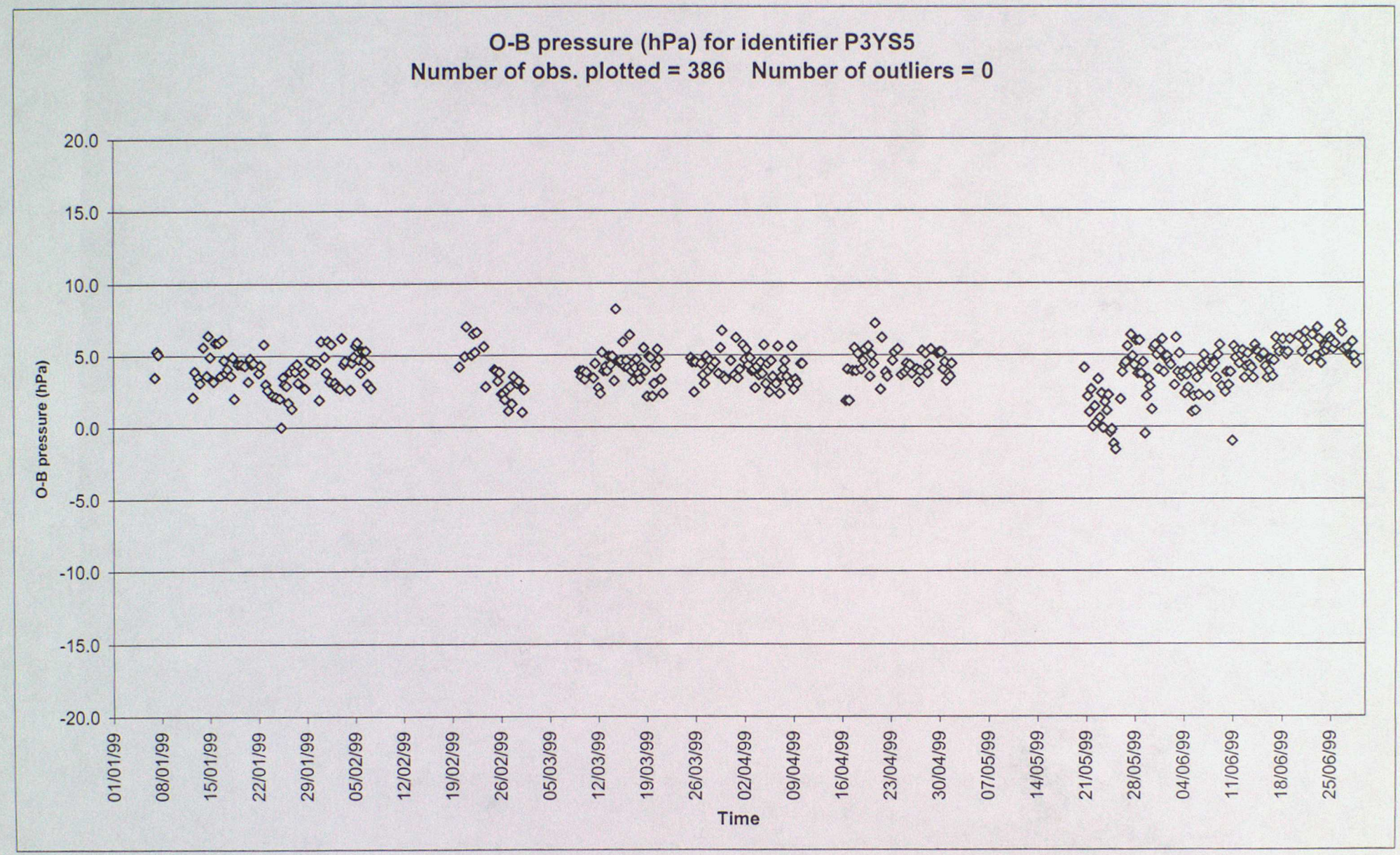

O-B pressure (hPa) for identifier OZBW6
Number of obs. plotted = 322 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

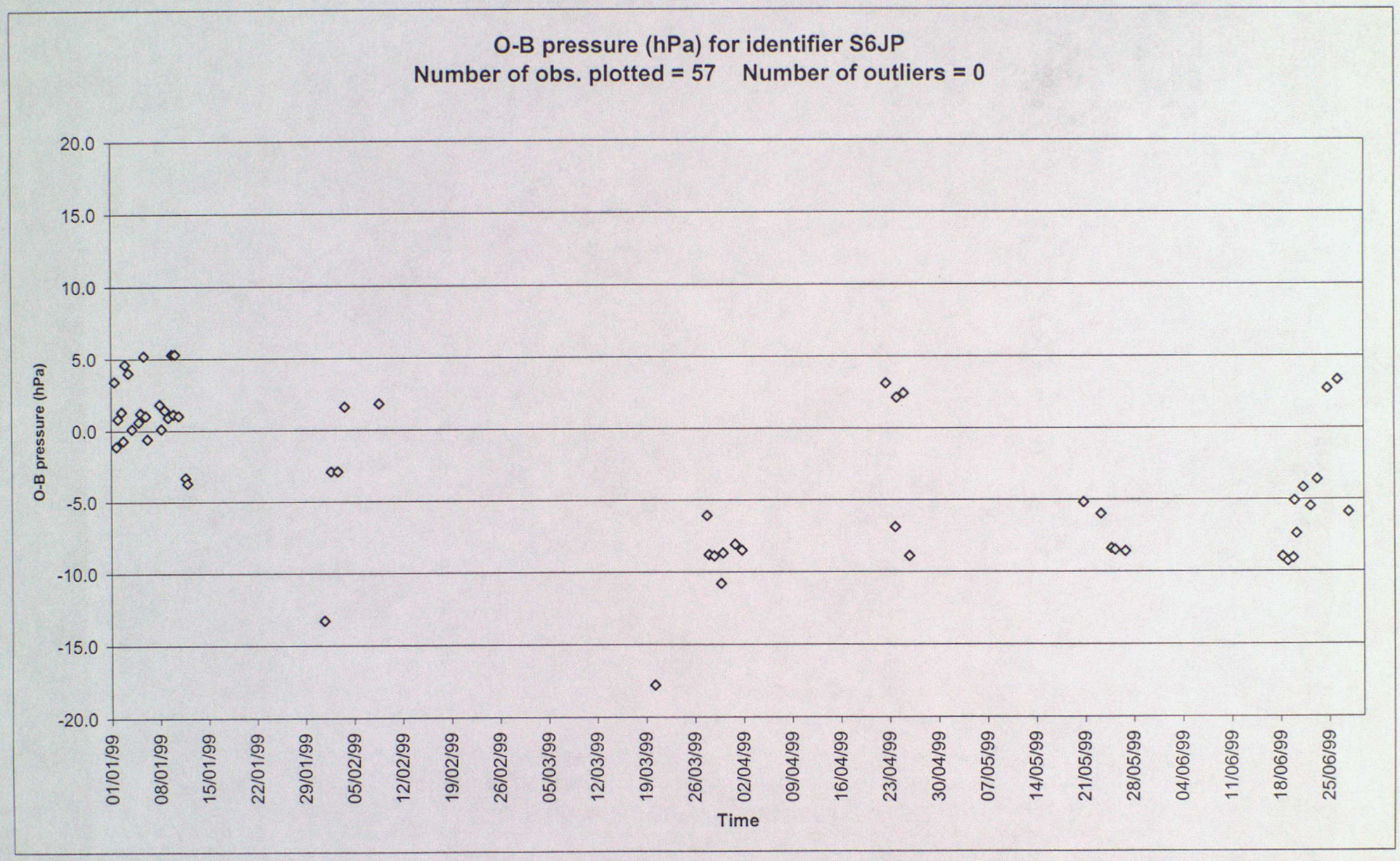

O-B pressure (hPa) for identifier PCBU
Number of obs. plotted = 64 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

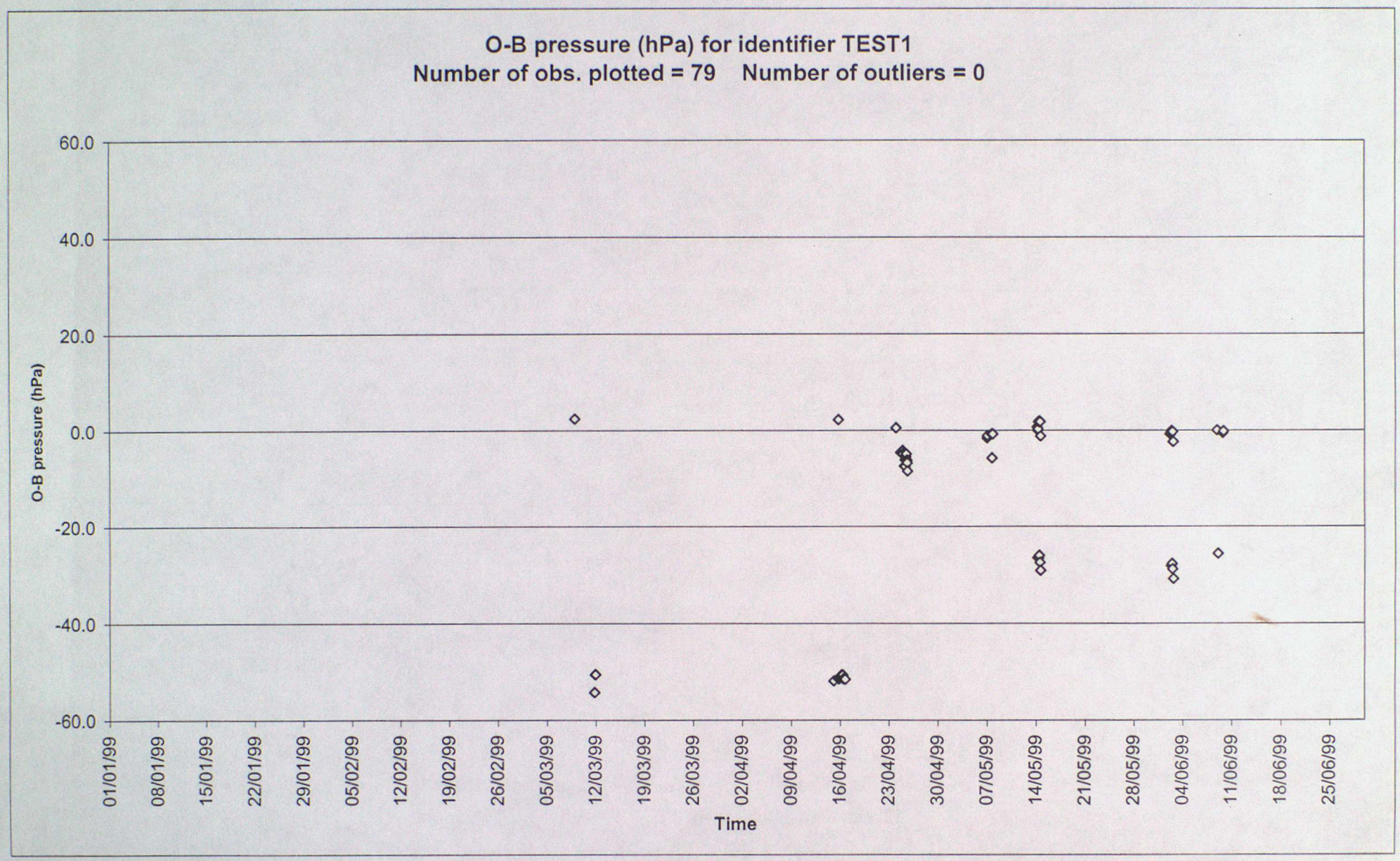

O-B pressure (hPa) for identifier PCCZ
Number of obs. plotted = 107 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

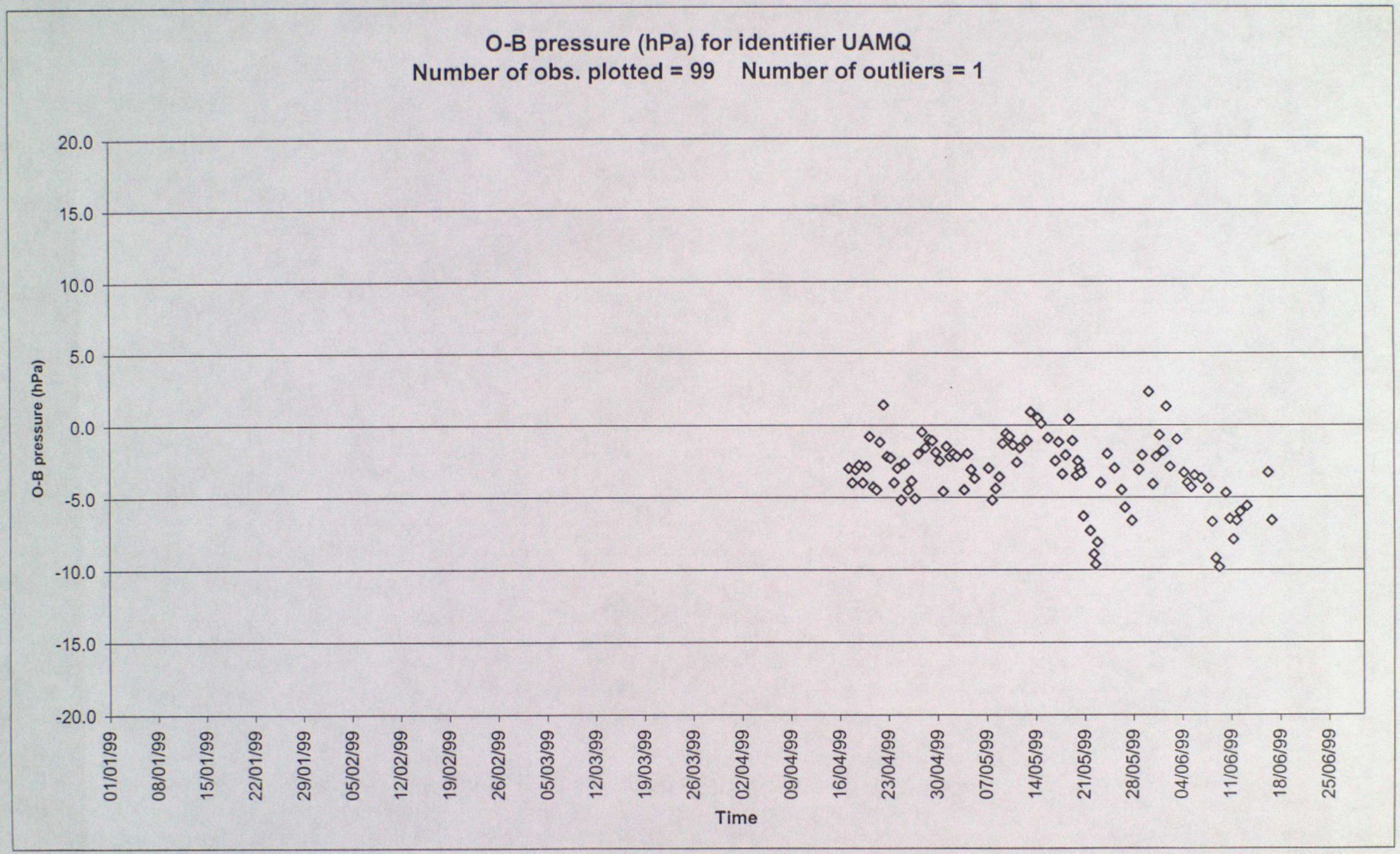

O-B pressure (hPa) for identifier PEXX
Number of obs. plotted = 192 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

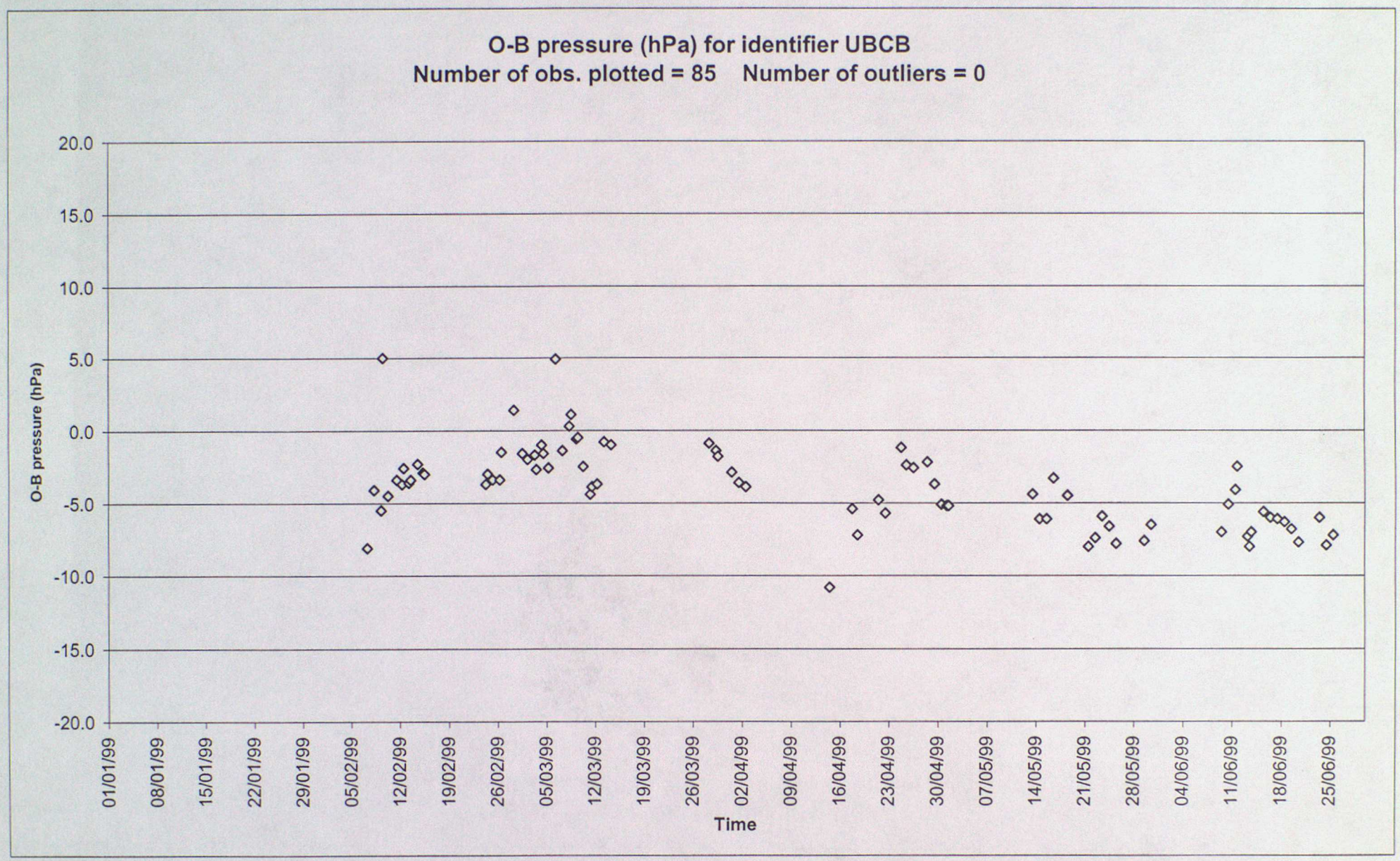

O-B pressure (hPa) for identifier PJKP
Number of obs. plotted = 191 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

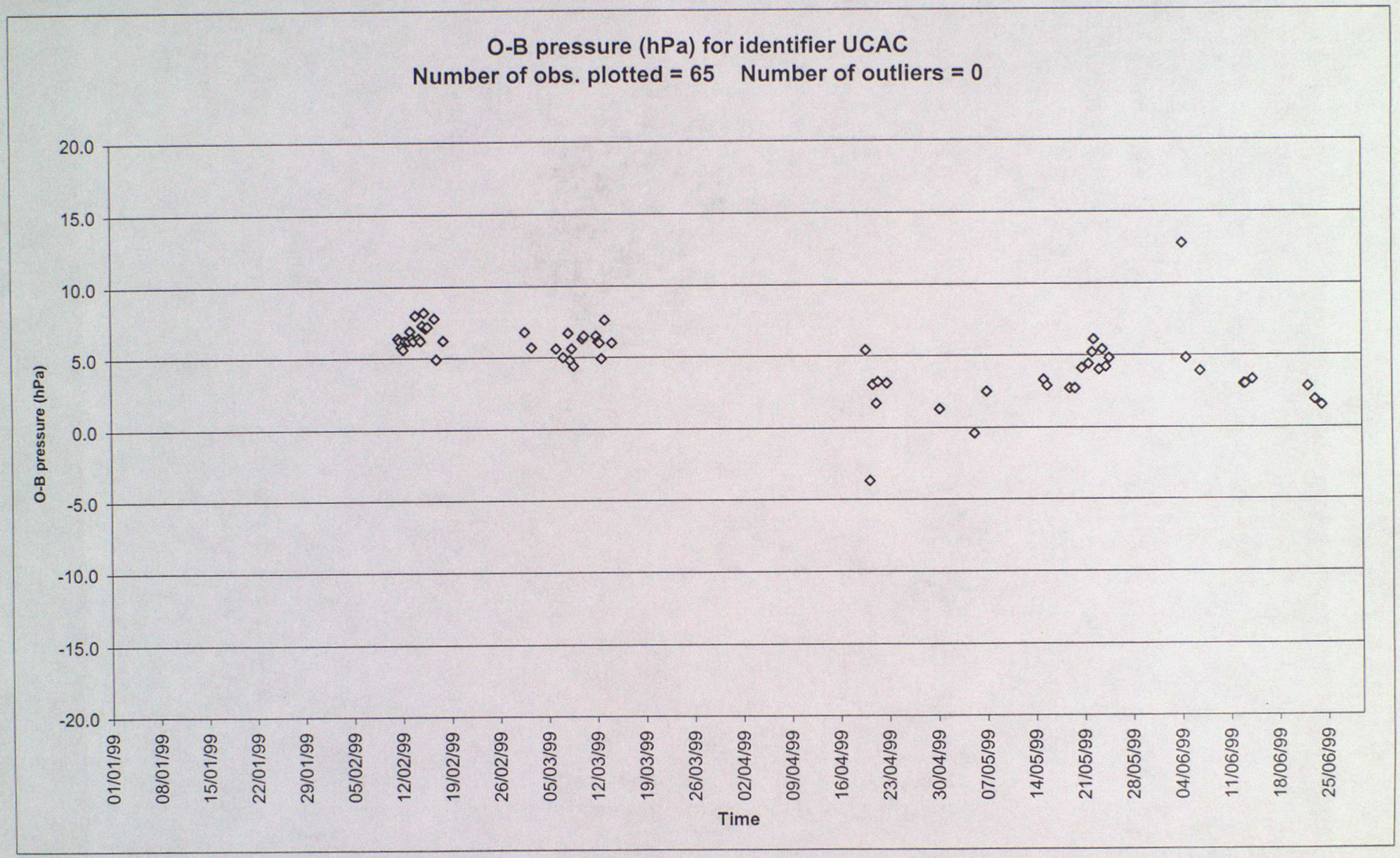

O-B pressure (hPa) for identifier P3YS5
Number of obs. plotted = 386 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

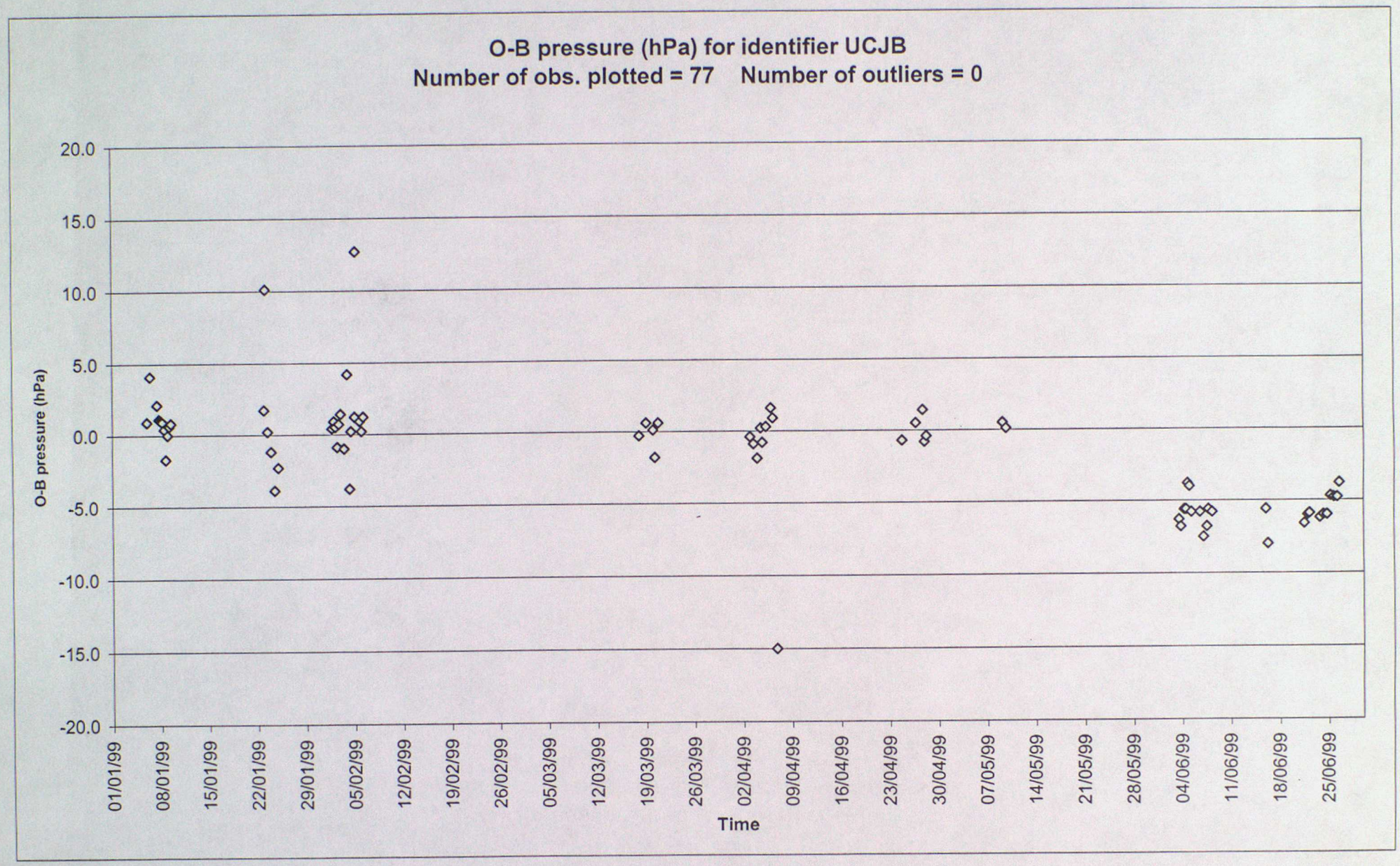

O-B pressure (hPa) for identifier S6JP
Number of obs. plotted = 57 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

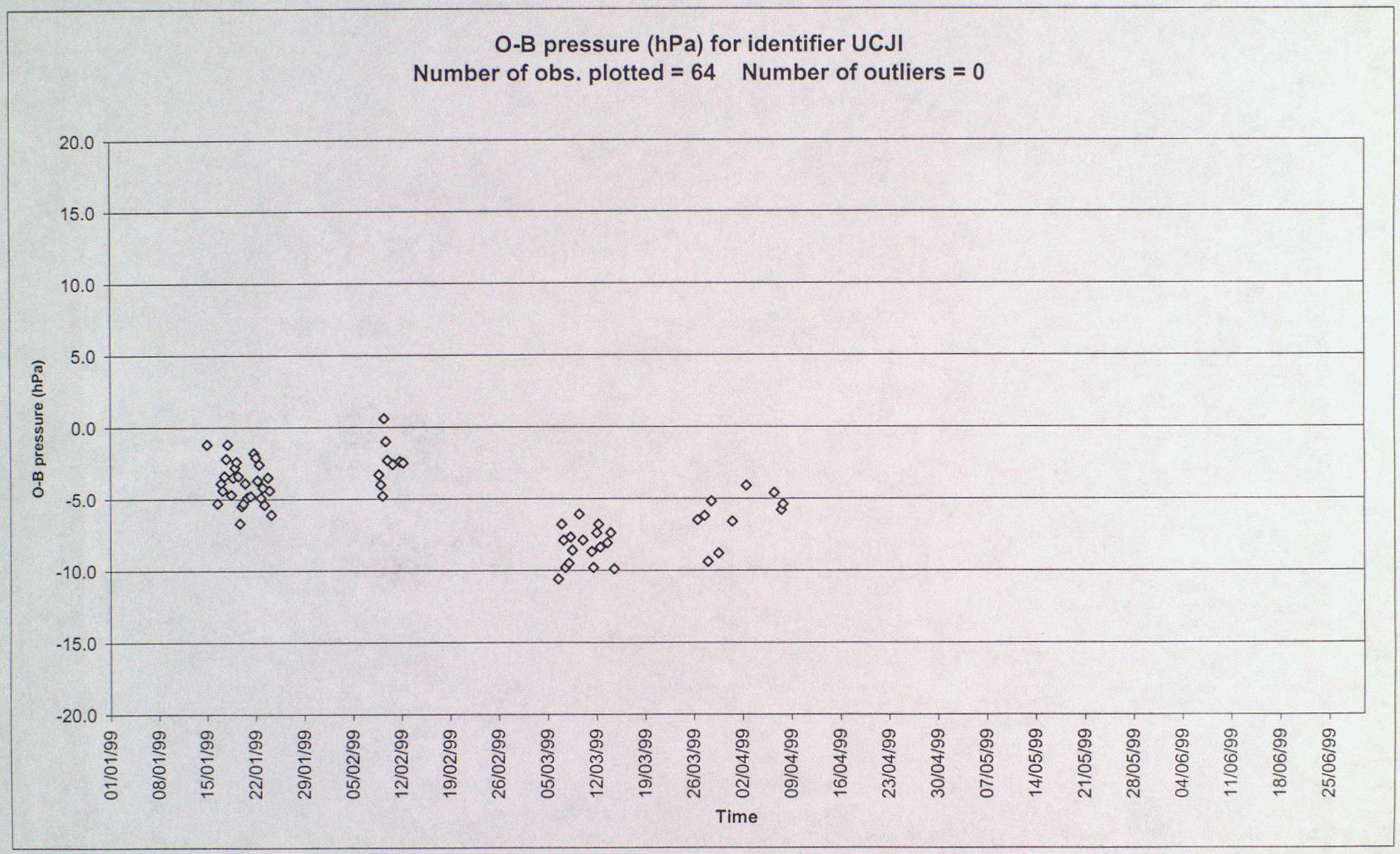

O-B pressure (hPa) for identifier TEST1
Number of obs. plotted = 79 Number of outliers = 0
O-B pressure (hPa)
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

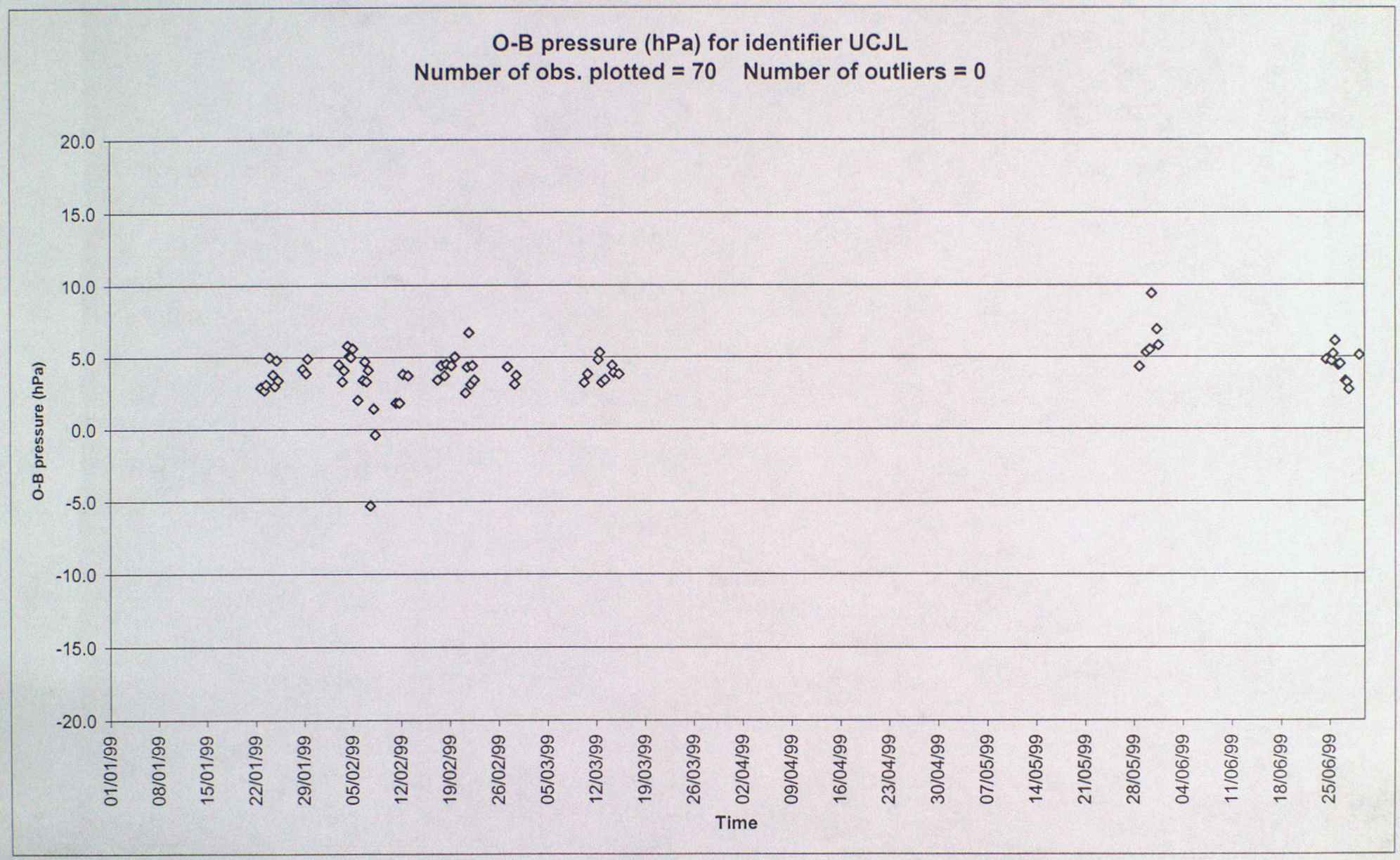

O-B pressure (hPa) for identifier UAMQ
Number of obs. plotted = 99 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

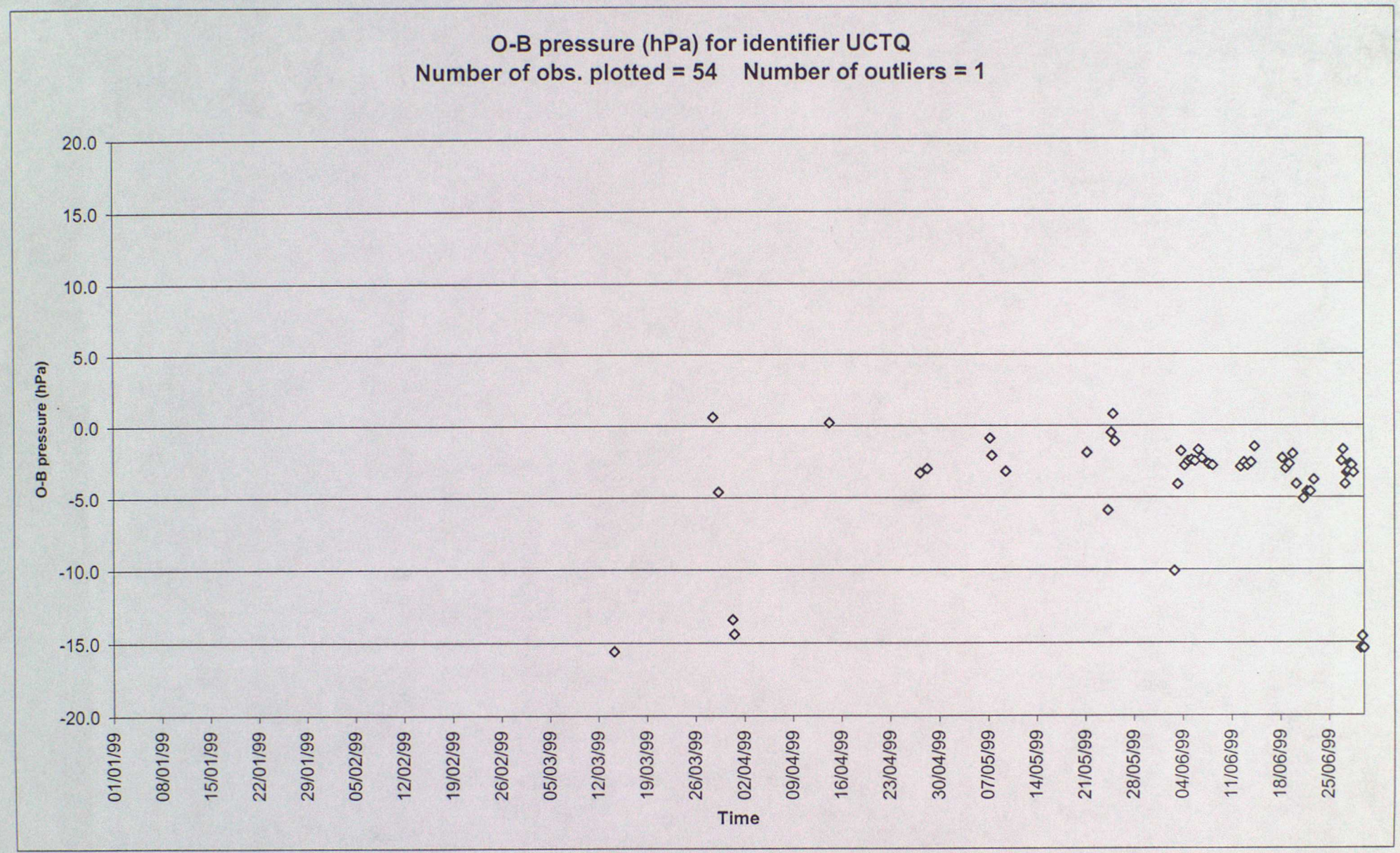

O-B pressure (hPa) for identifier UBCB
Number of obs. plotted = 85 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

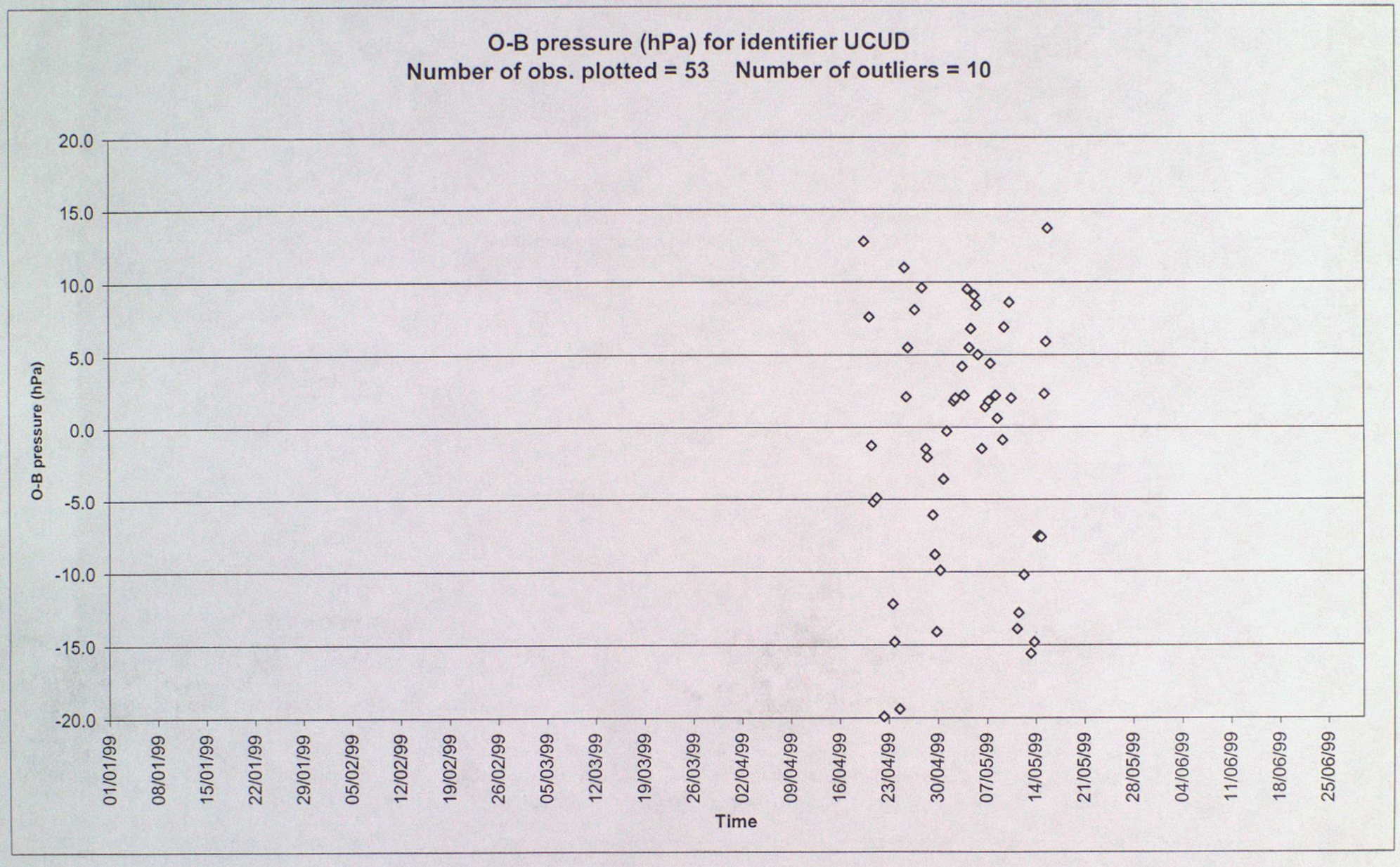

O-B pressure (hPa) for identifier UCAC
Number of obs. plotted = 65 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

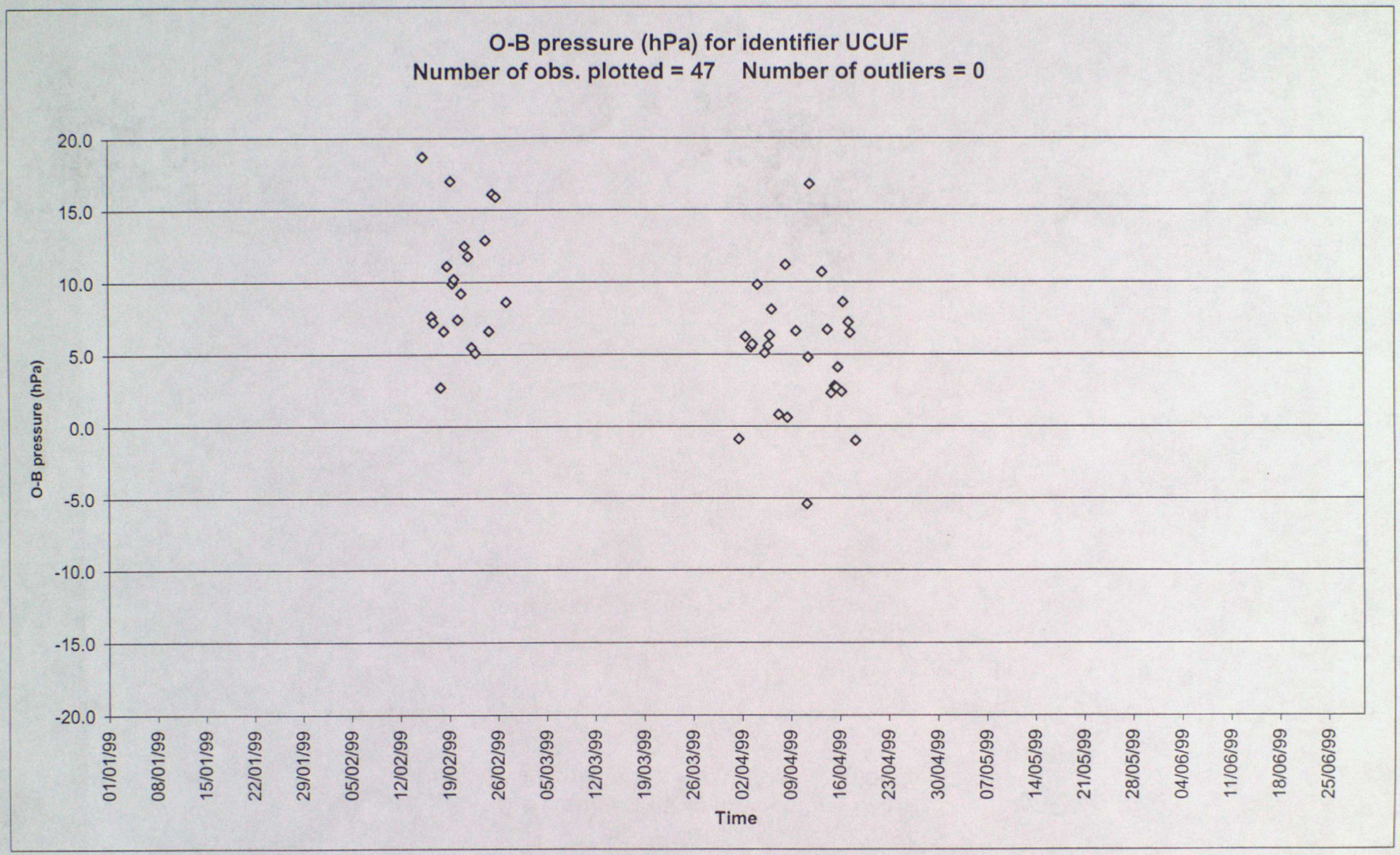

O-B pressure (hPa) for identifier UCJB
Number of obs. plotted = 77 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

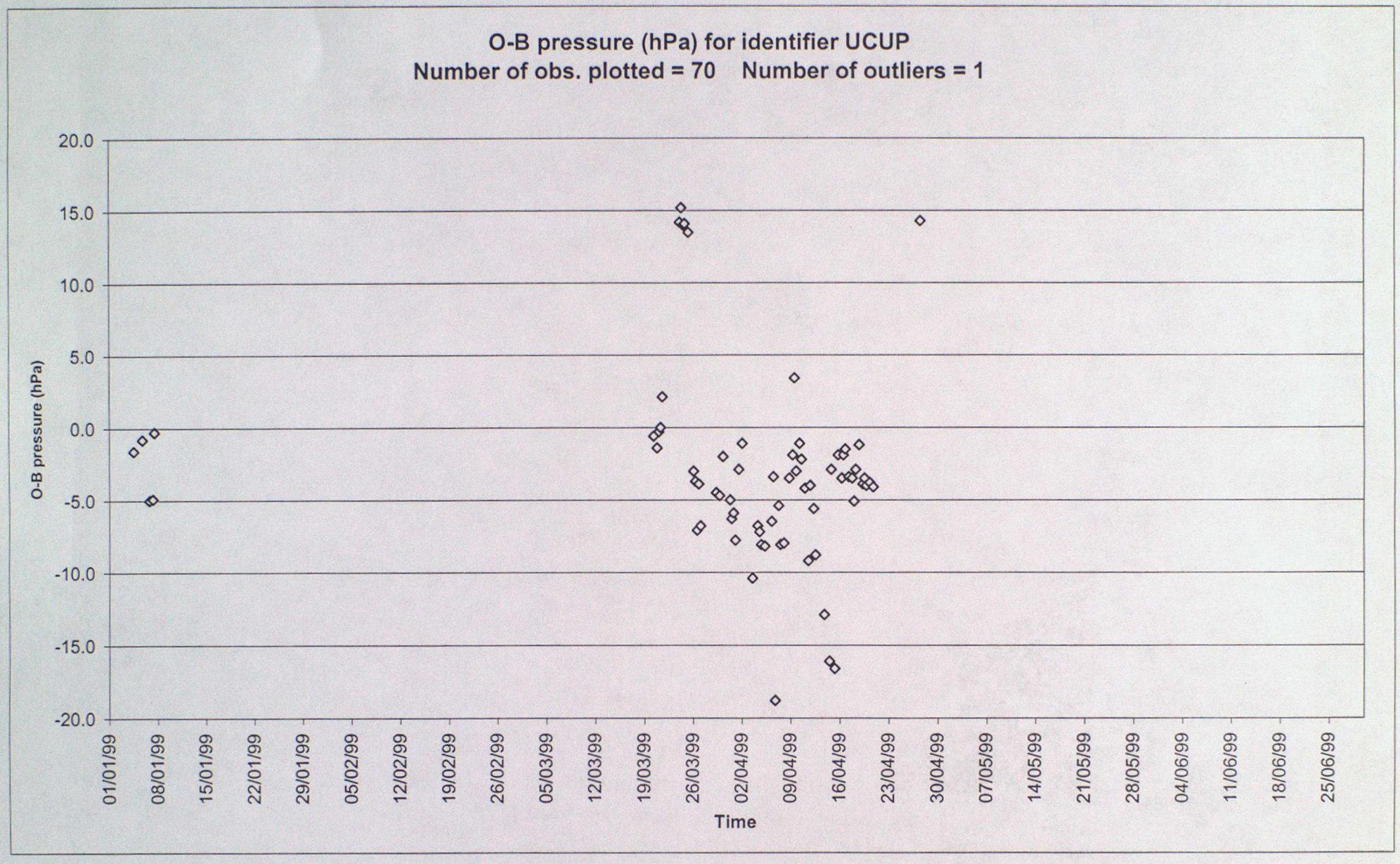

O-B pressure (hPa) for identifier UCJI
Number of obs. plotted = 64 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UCJL
Number of obs. plotted = 70 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UCTQ
Number of obs. plotted = 54 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UCUD
Number of obs. plotted = 53 Number of outliers = 10
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UCUF
Number of obs. plotted = 47 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UCUP
Number of obs. plotted = 70 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
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21/05/99
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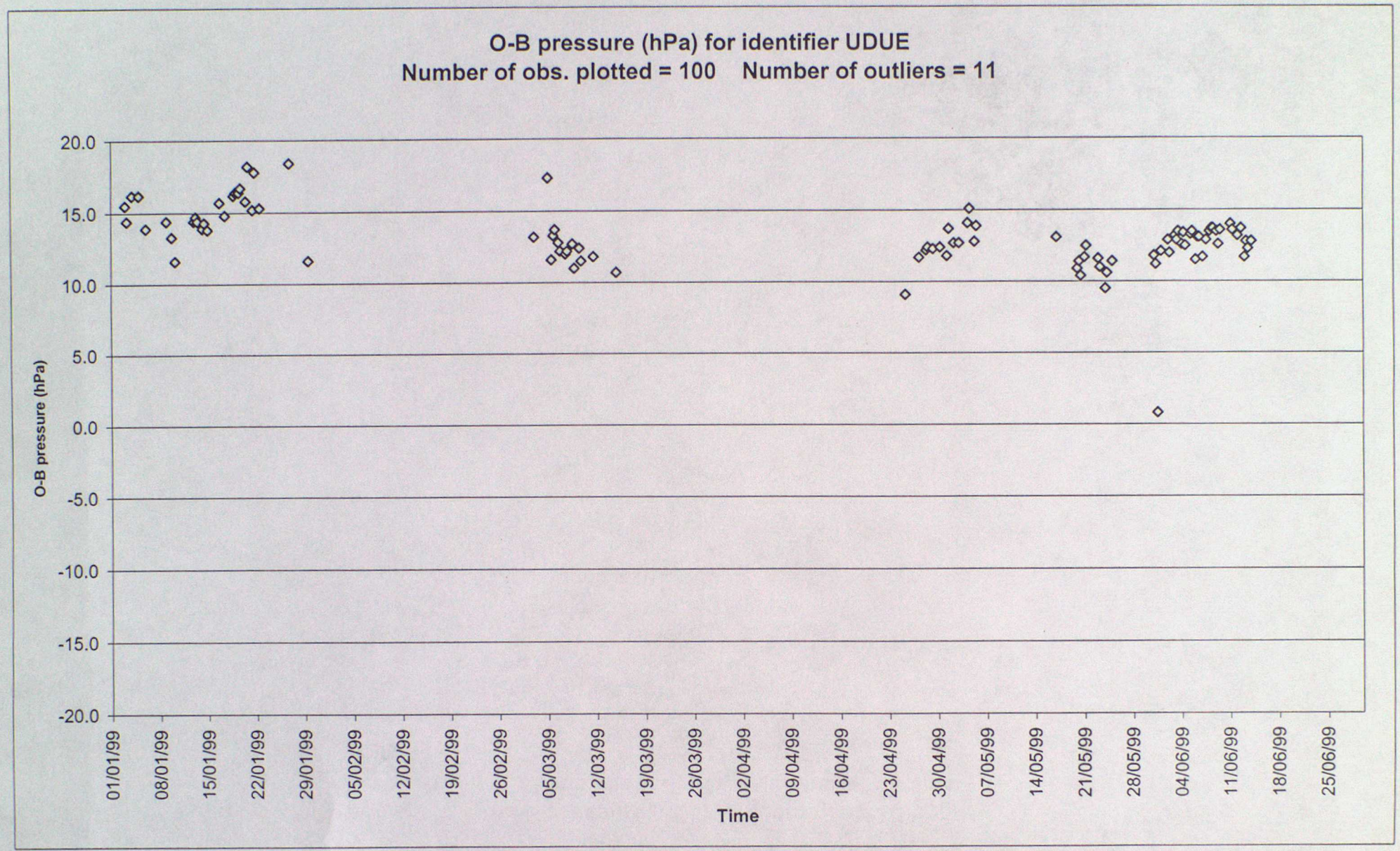
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier UDUE
Number of obs. plotted = 100 Number of outliers = 11
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
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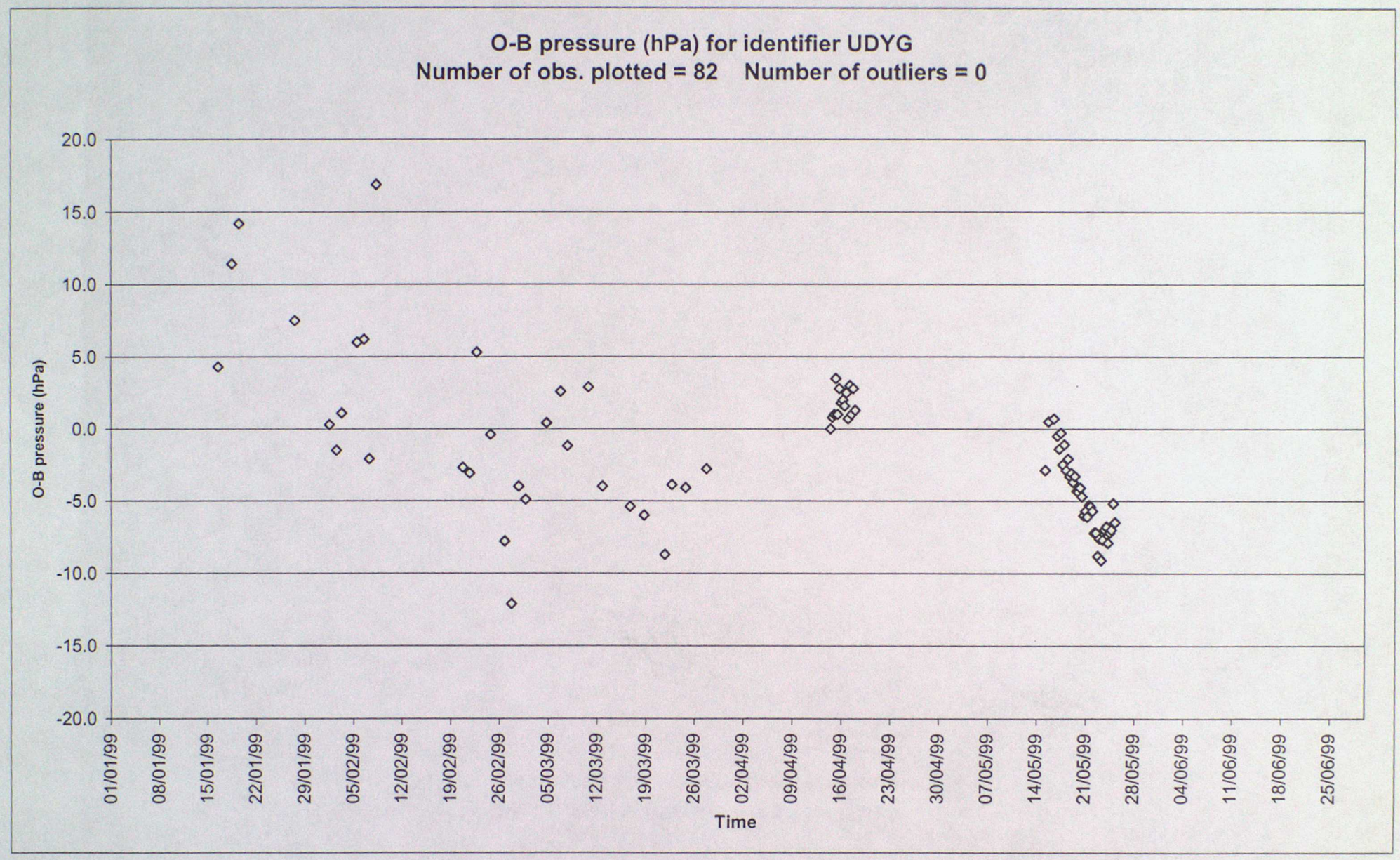
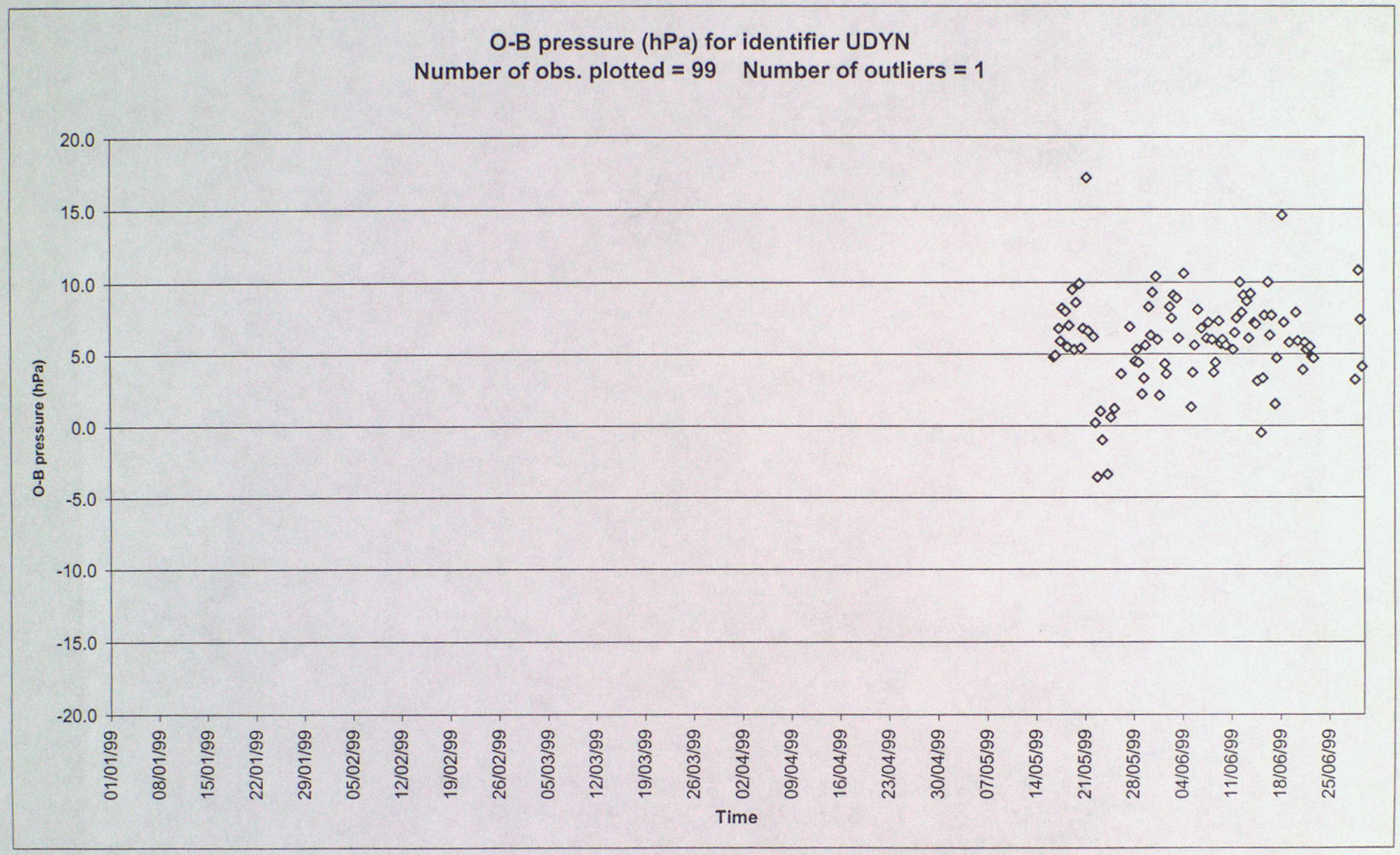
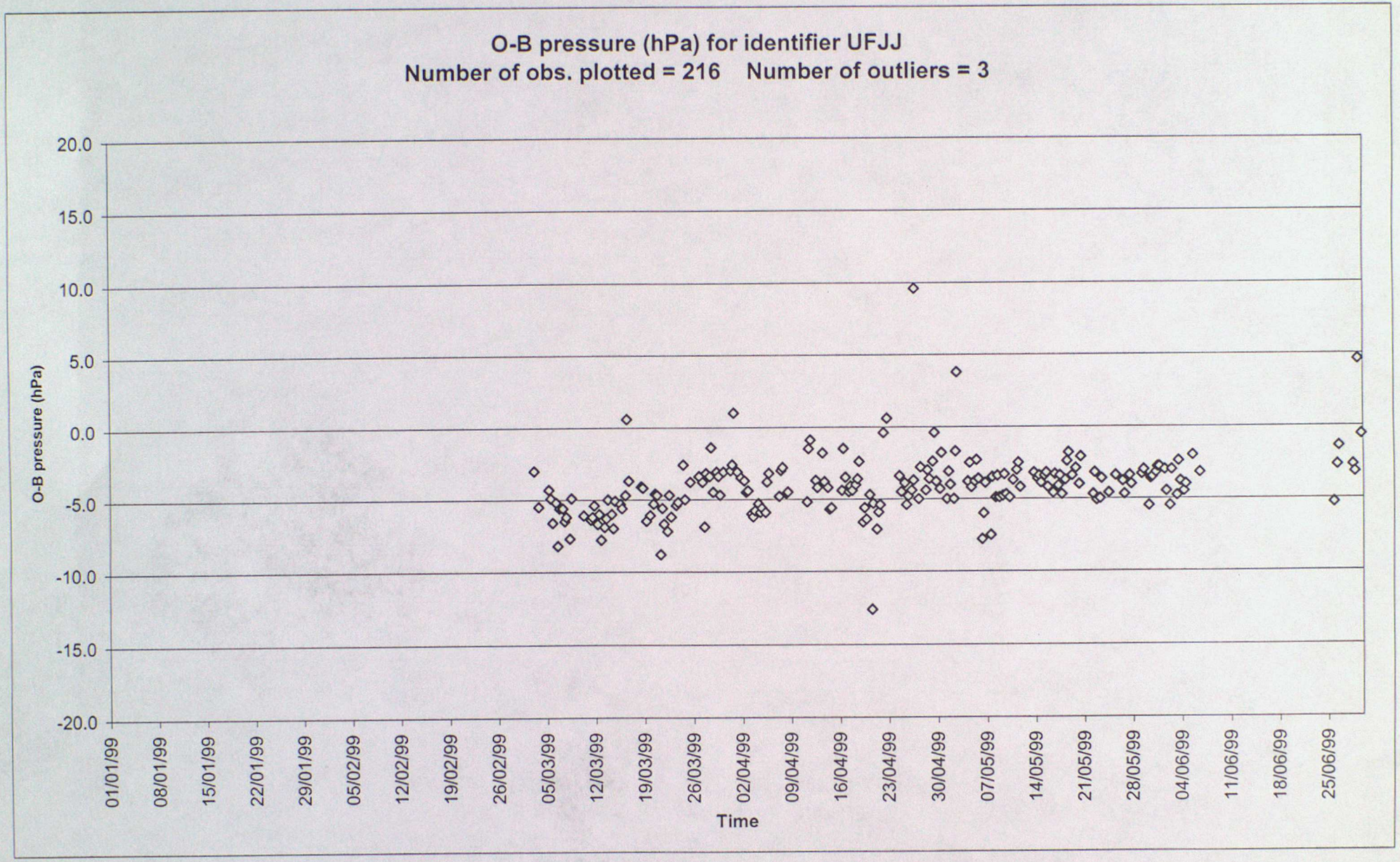
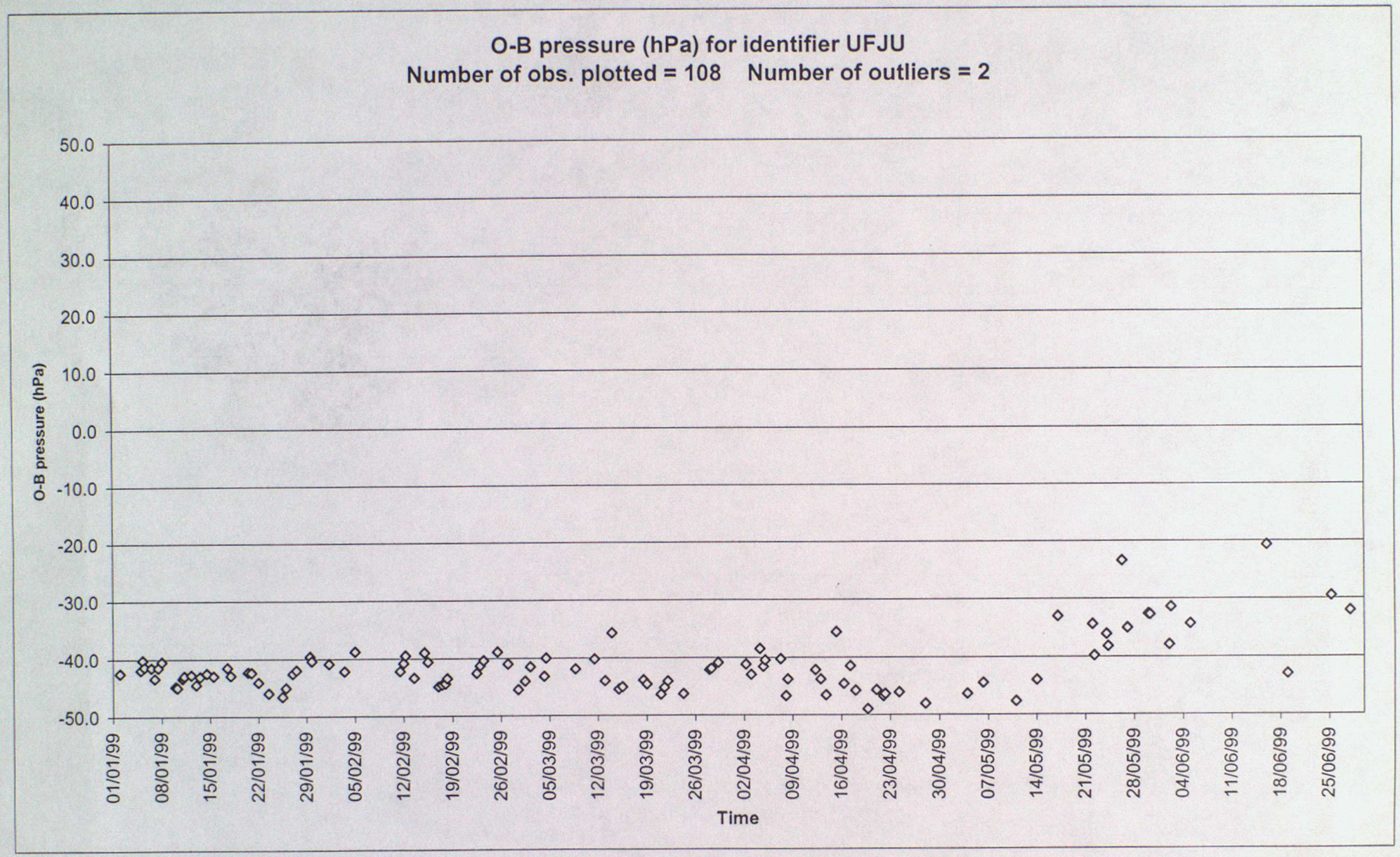
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

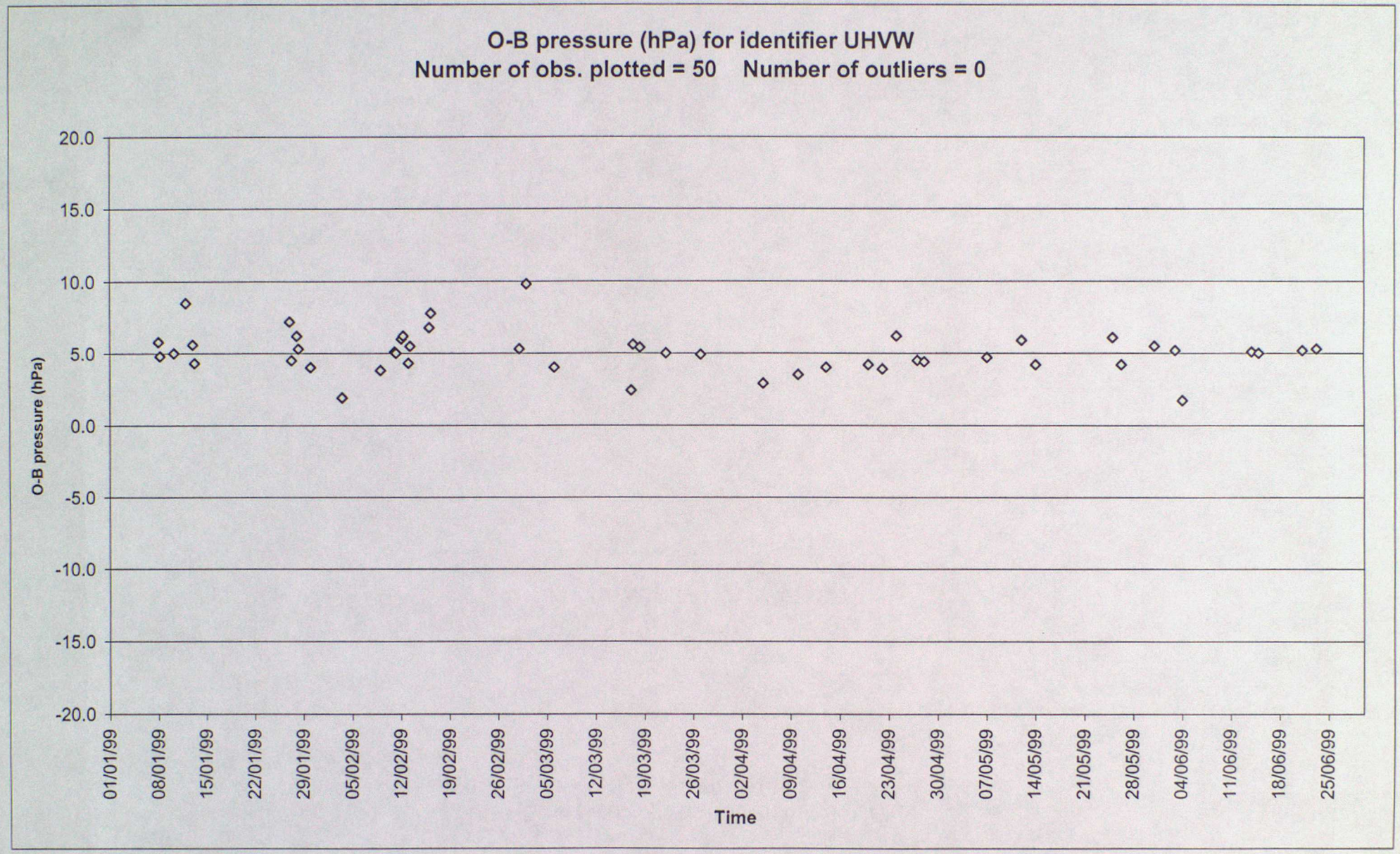

O-B pressure (hPa) for identifier UDYG
Number of obs. plotted = 82 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

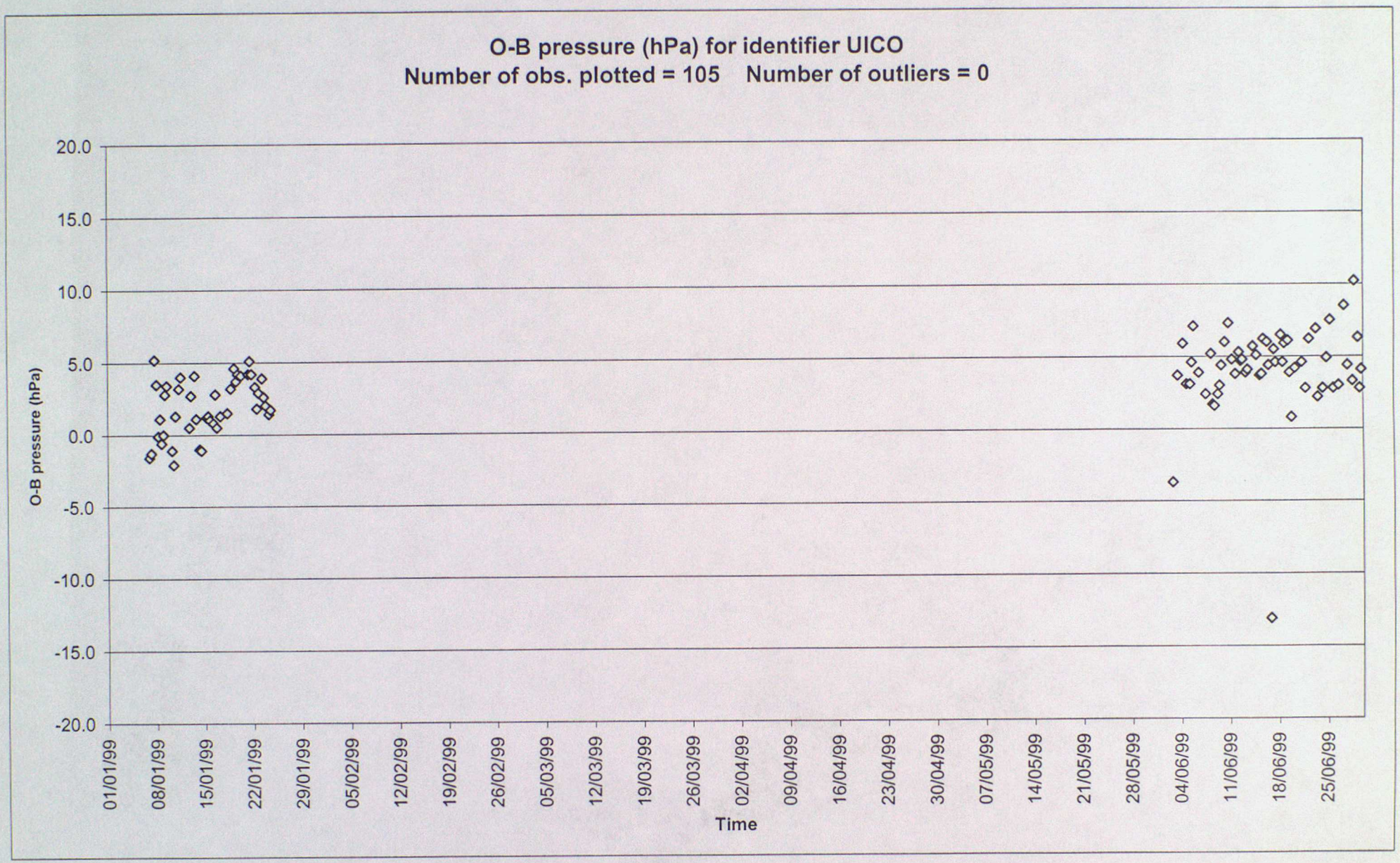

O-B pressure (hPa) for identifier UDYN
Number of obs. plotted = 99 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

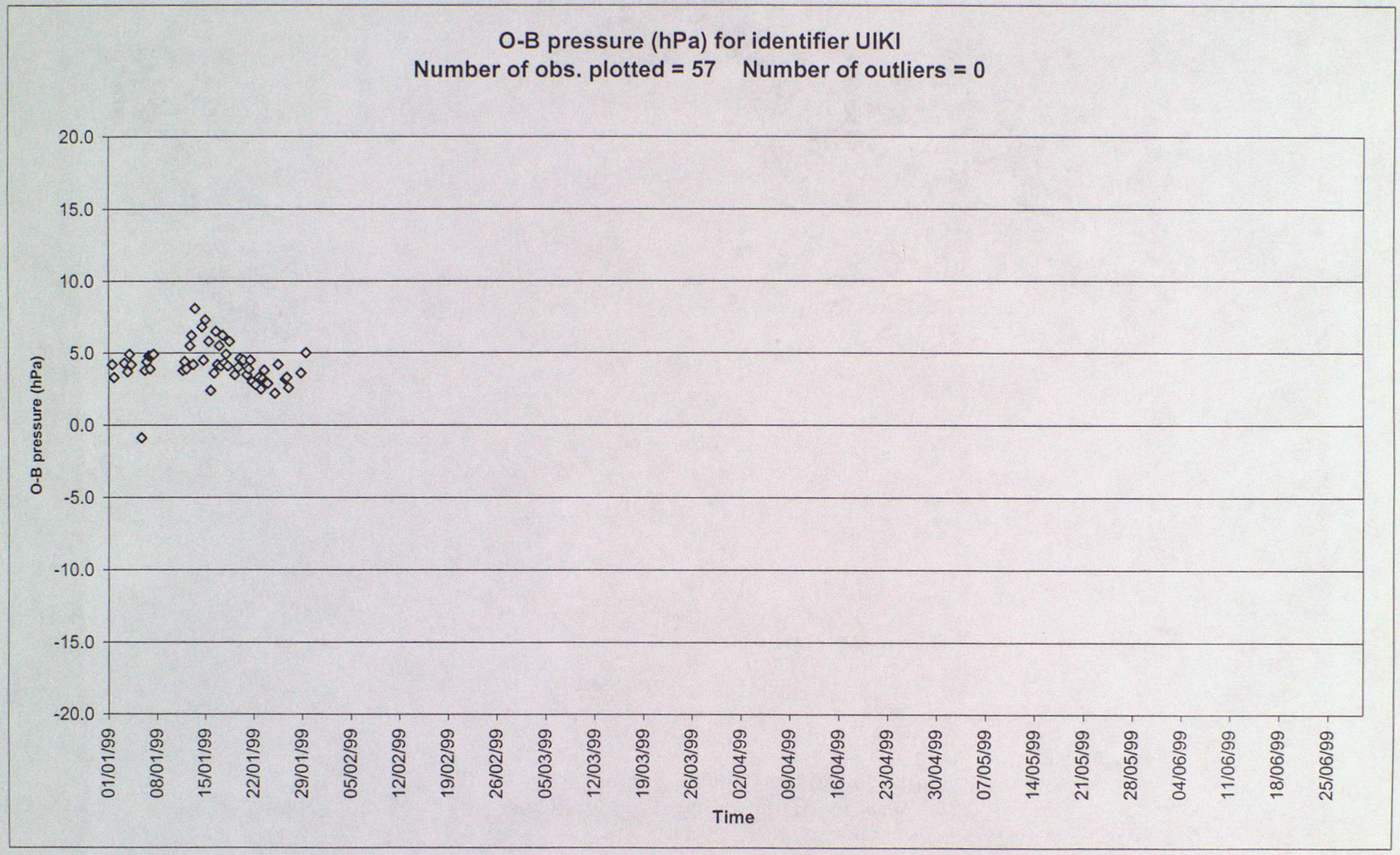

O-B pressure (hPa) for identifier UFJJ
Number of obs. plotted = 216 Number of outliers = 3
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

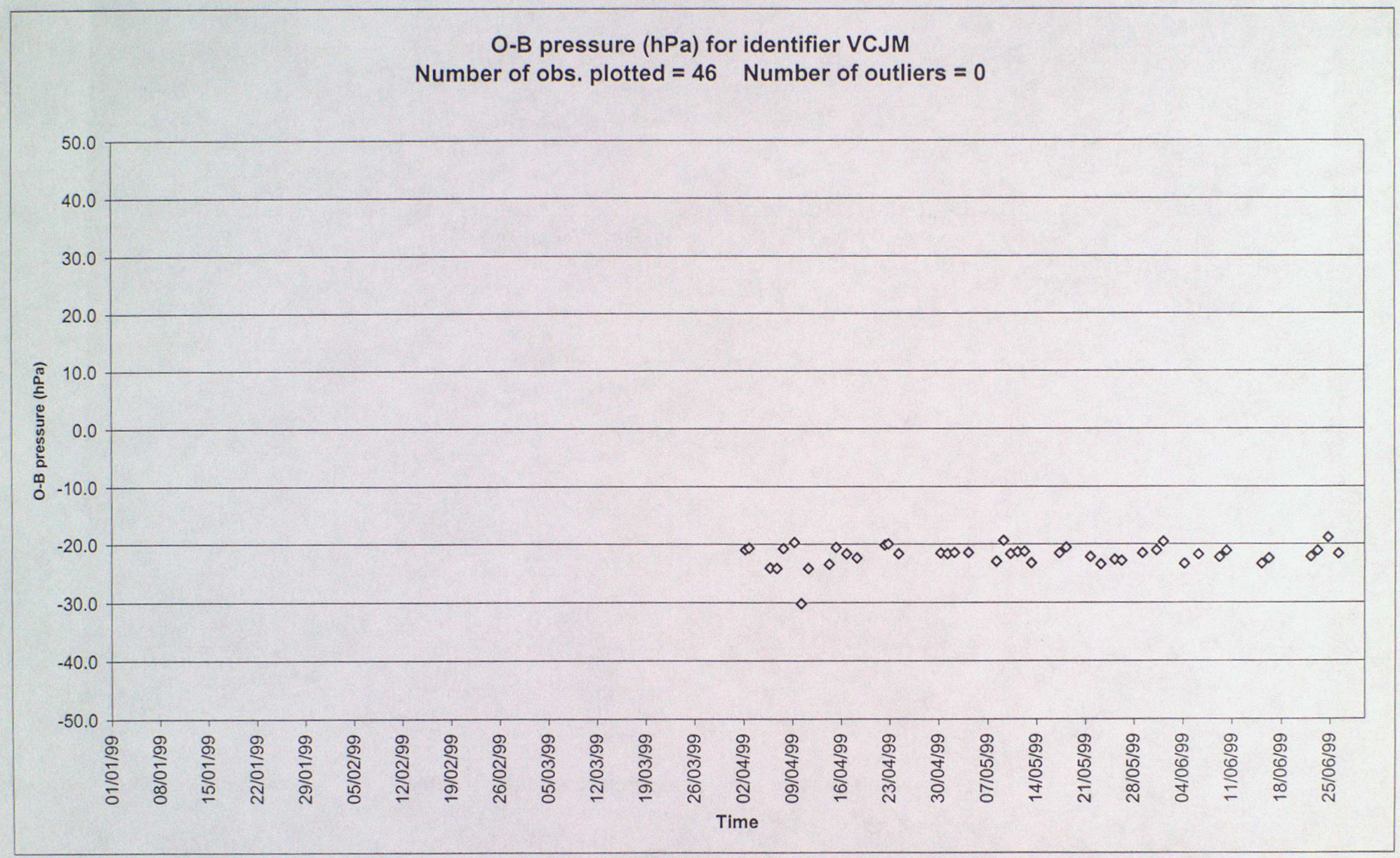

O-B pressure (hPa) for identifier UFJU
Number of obs. plotted = 108 Number of outliers = 2
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

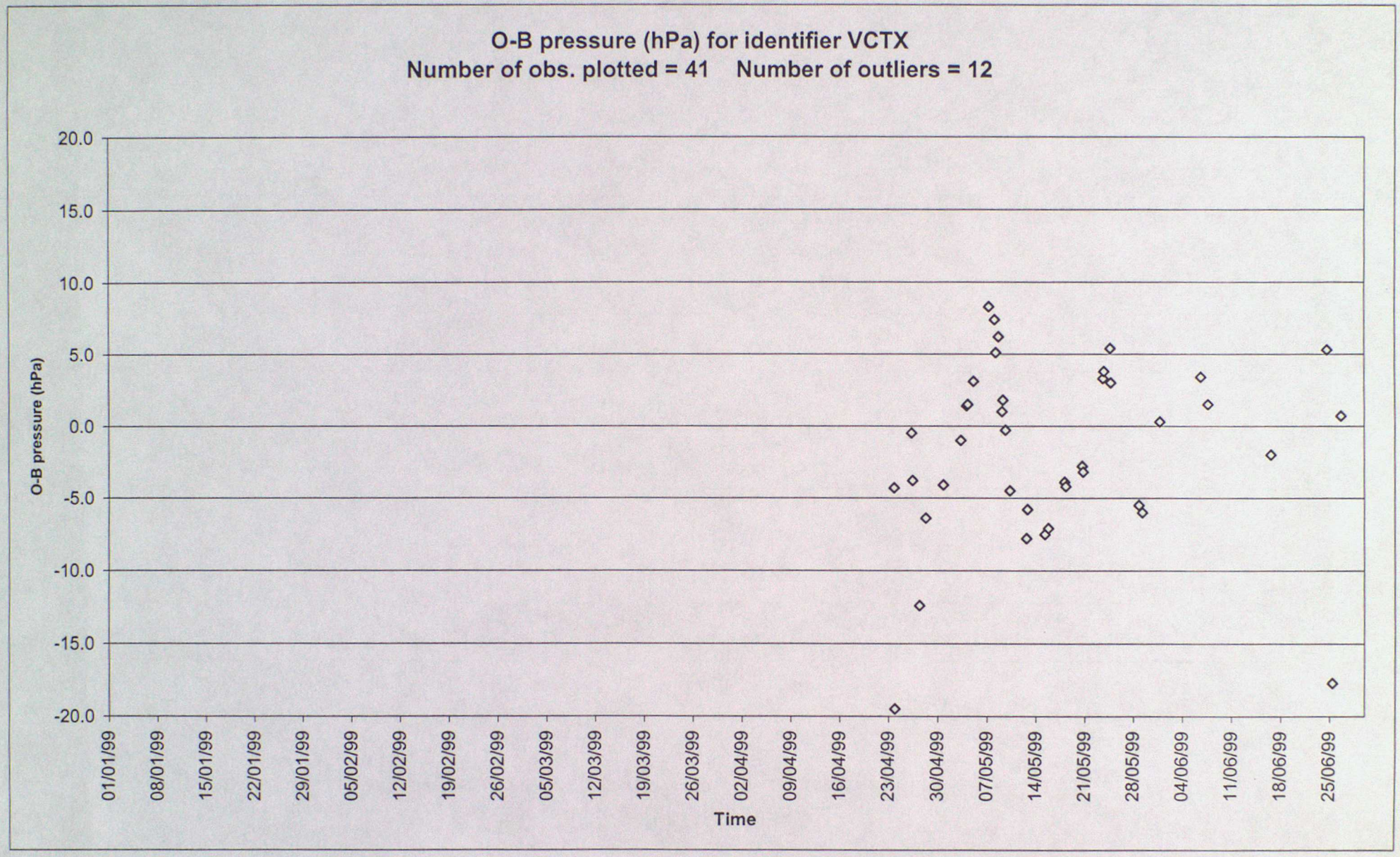
O-B pressure (hPa) for identifier UFYN
Number of obs. plotted = 79 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
Time
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99

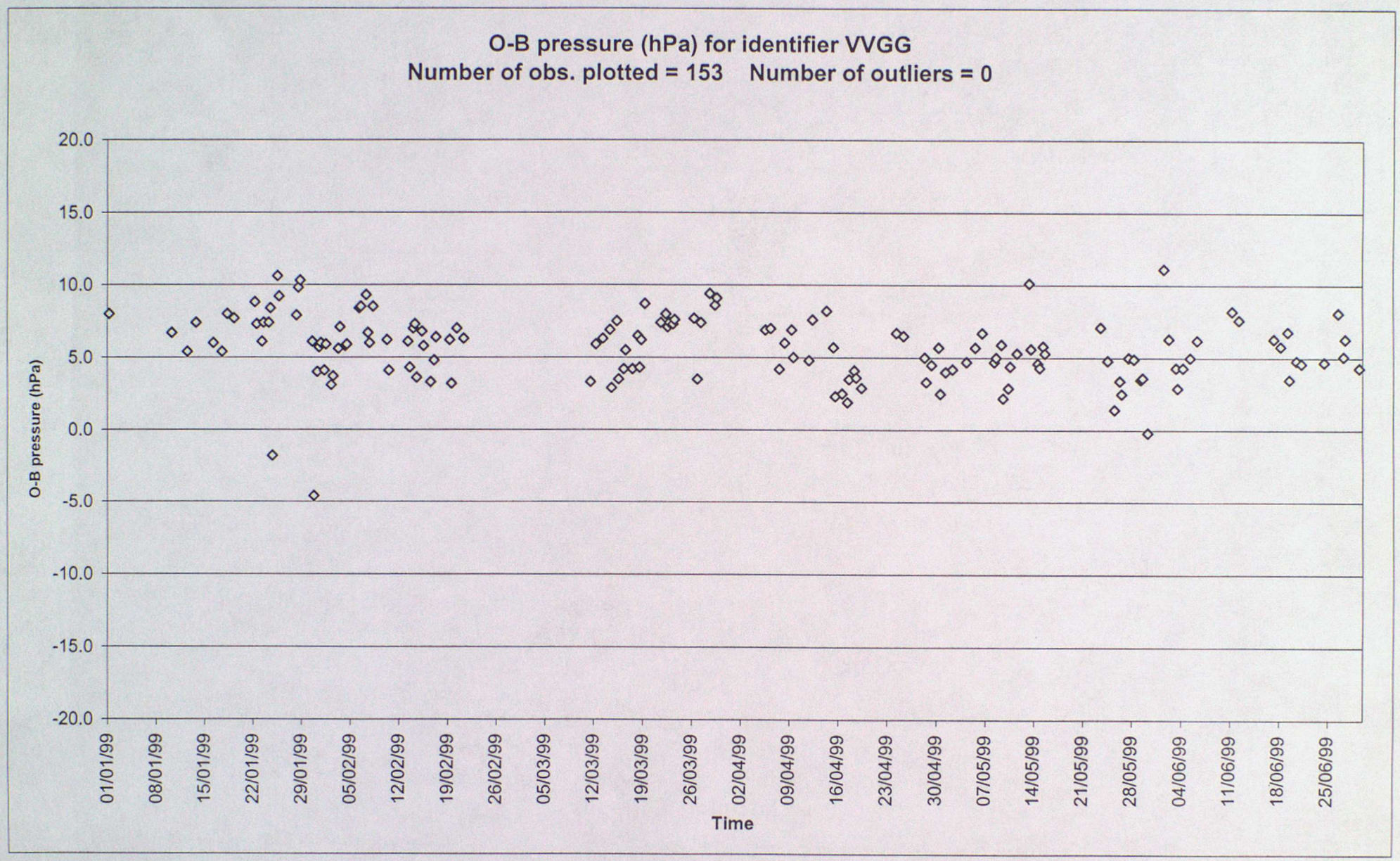

O-B pressure (hPa) for identifier UHVW
Number of obs. plotted = 50 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

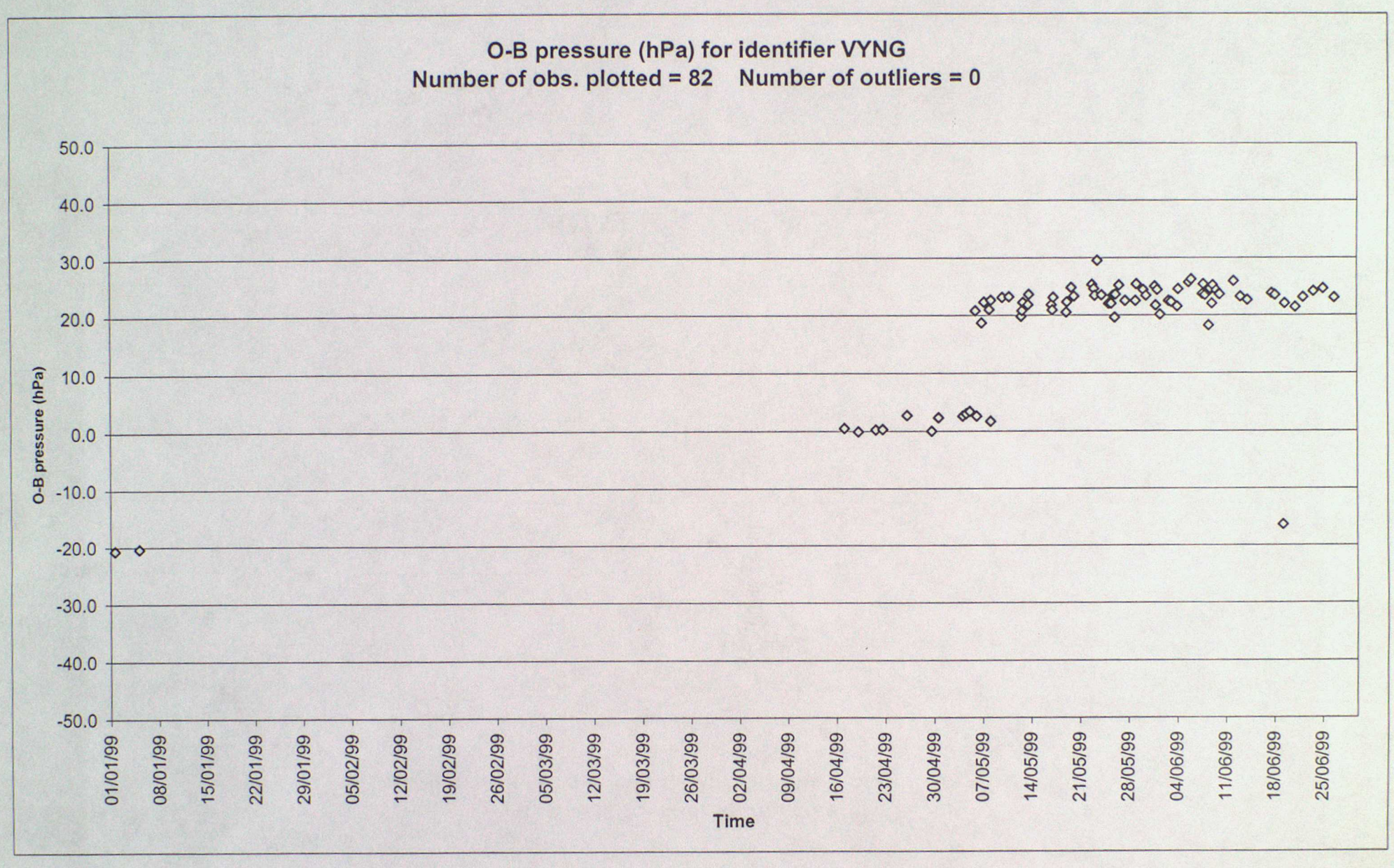

O-B pressure (hPa) for identifier UICO
Number of obs. plotted = 105 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

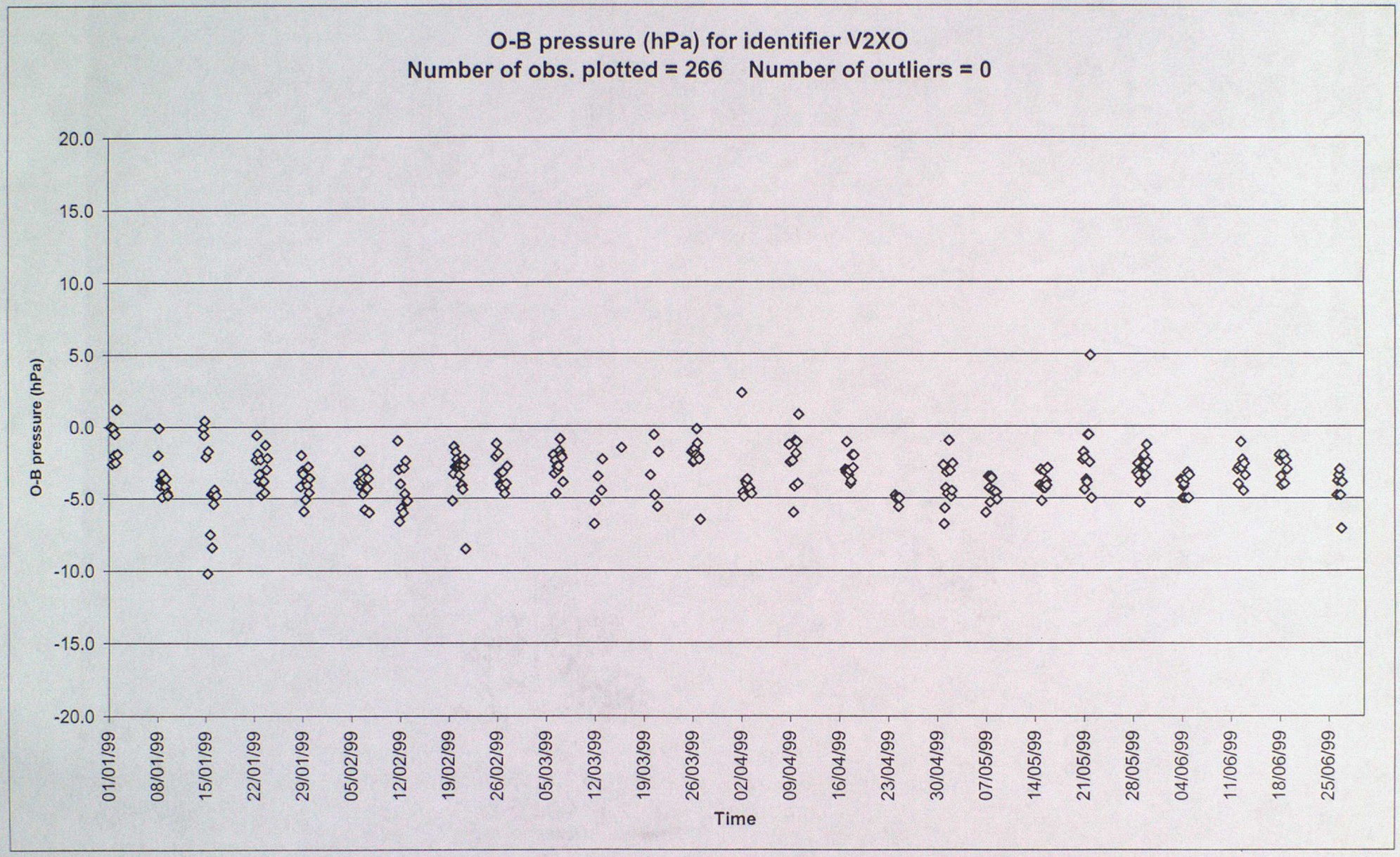

O-B pressure (hPa) for identifier UIKI
Number of obs. plotted = 57 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

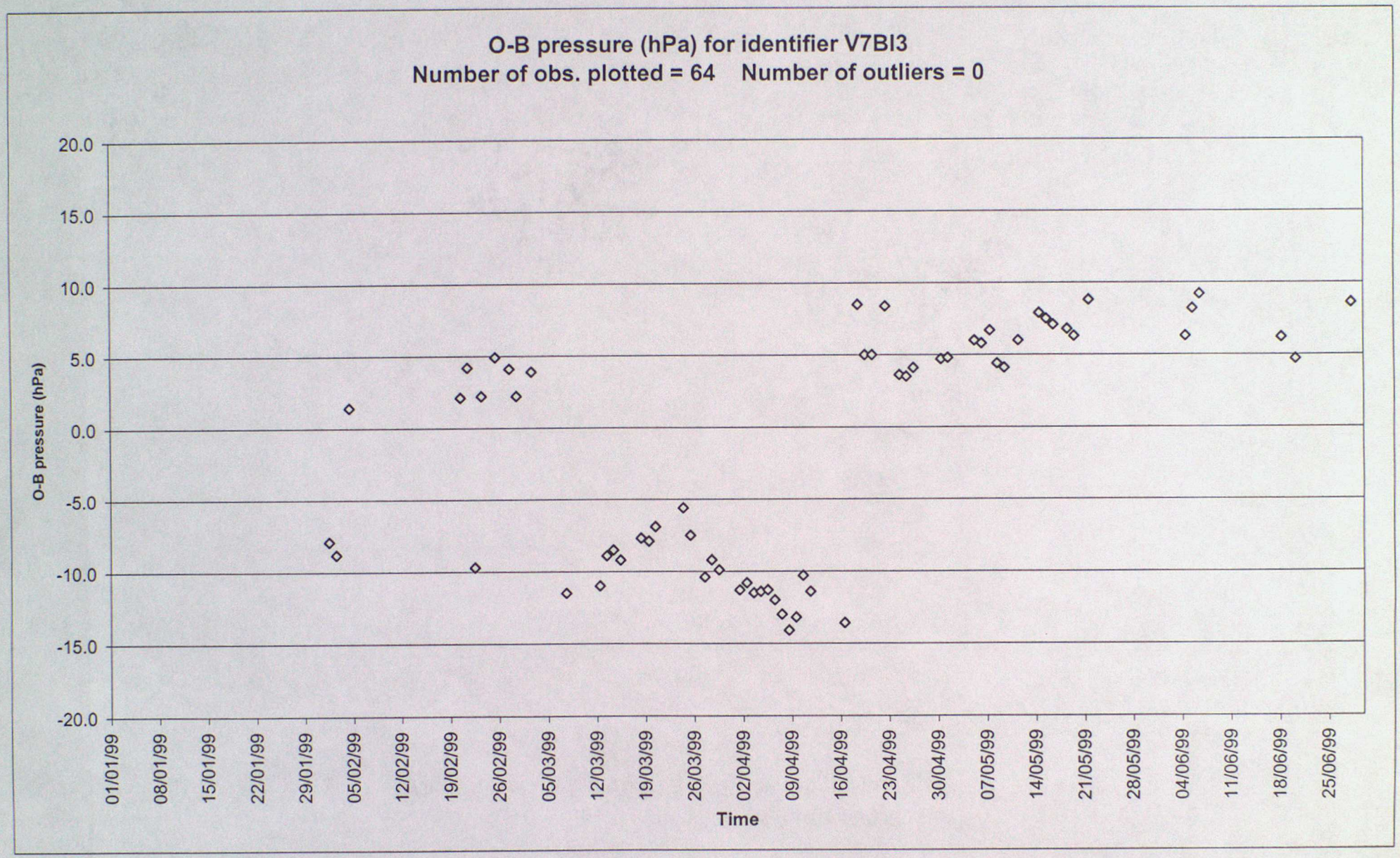

O-B pressure (hPa) for identifier VCJM
Number of obs. plotted = 46 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

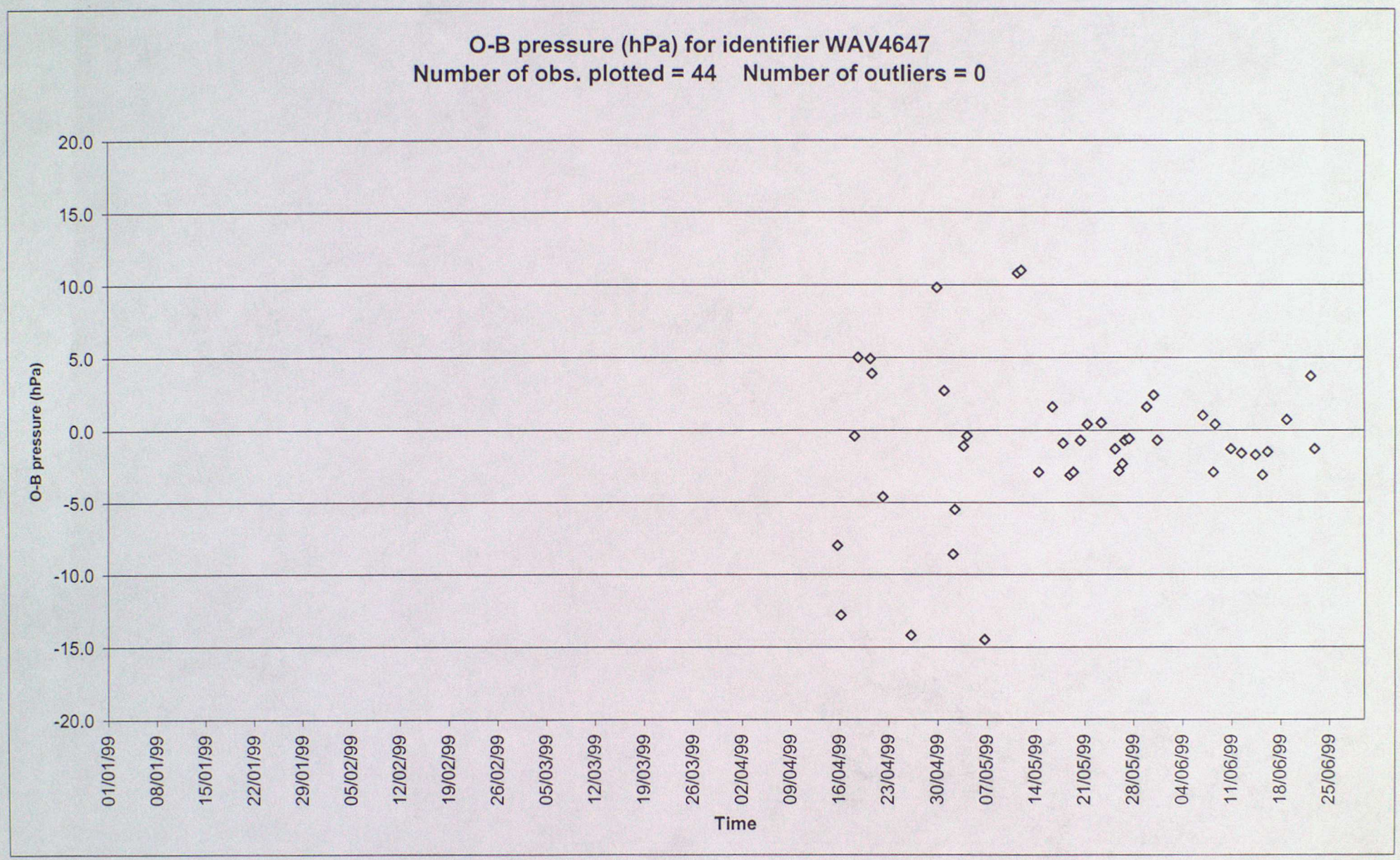

O-B pressure (hPa) for identifier VCTX
Number of obs. plotted = 41 Number of outliers = 12
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

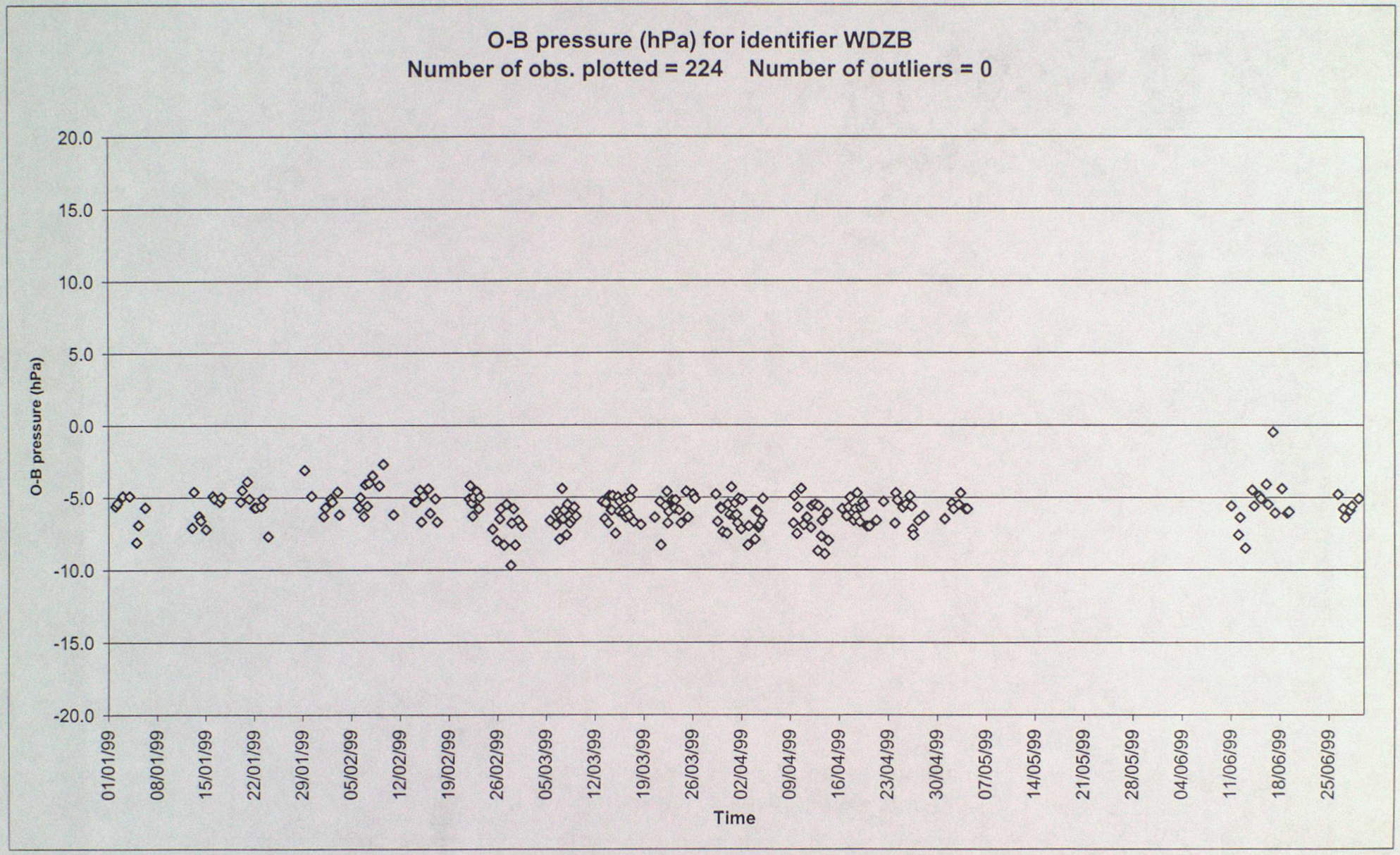

O-B pressure (hPa) for identifier VVGG
Number of obs. plotted = 153 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

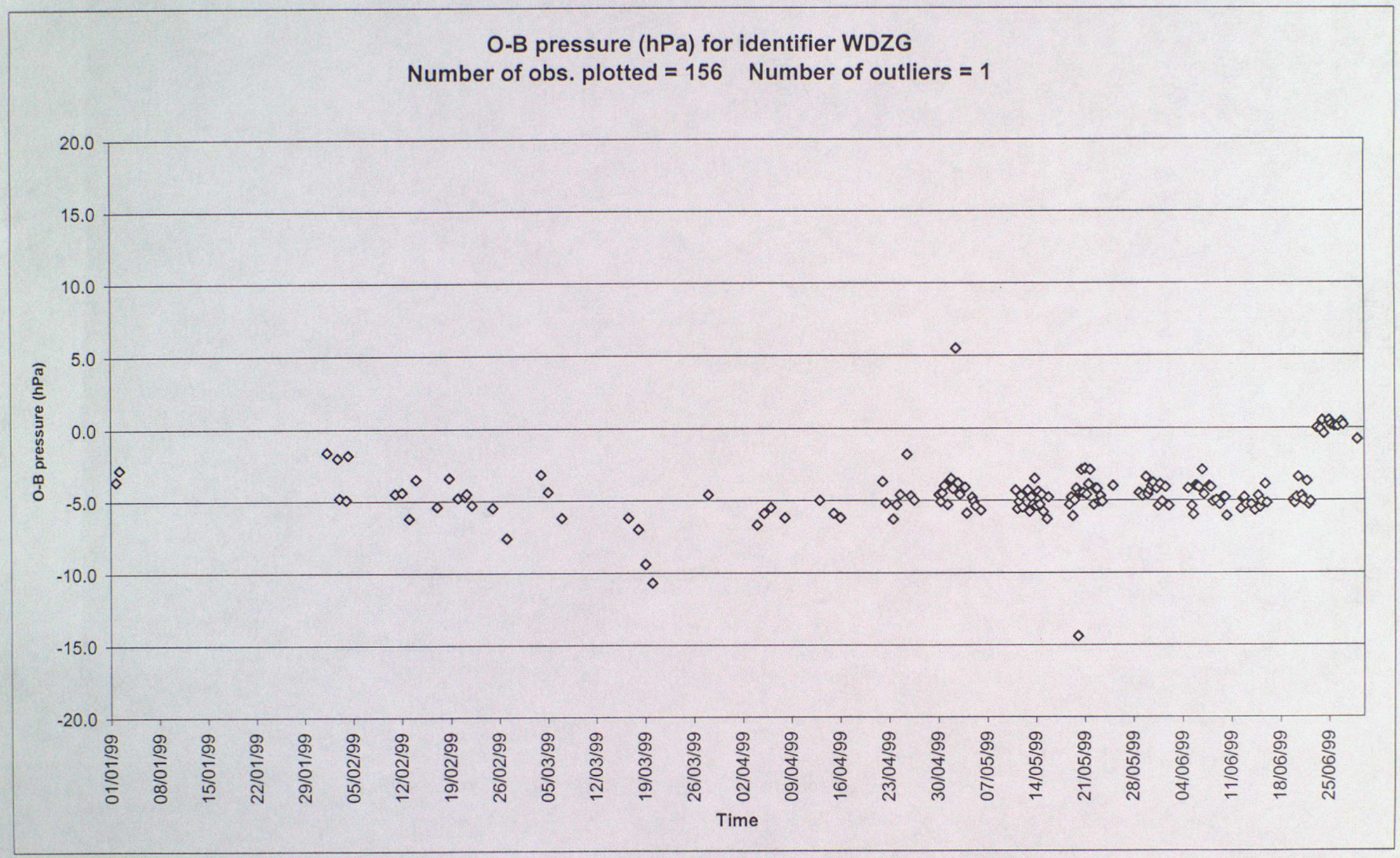

O-B pressure (hPa) for identifier VYNG
Number of obs. plotted = 82 Number of outliers = 0
O-B pressure (hPa)
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

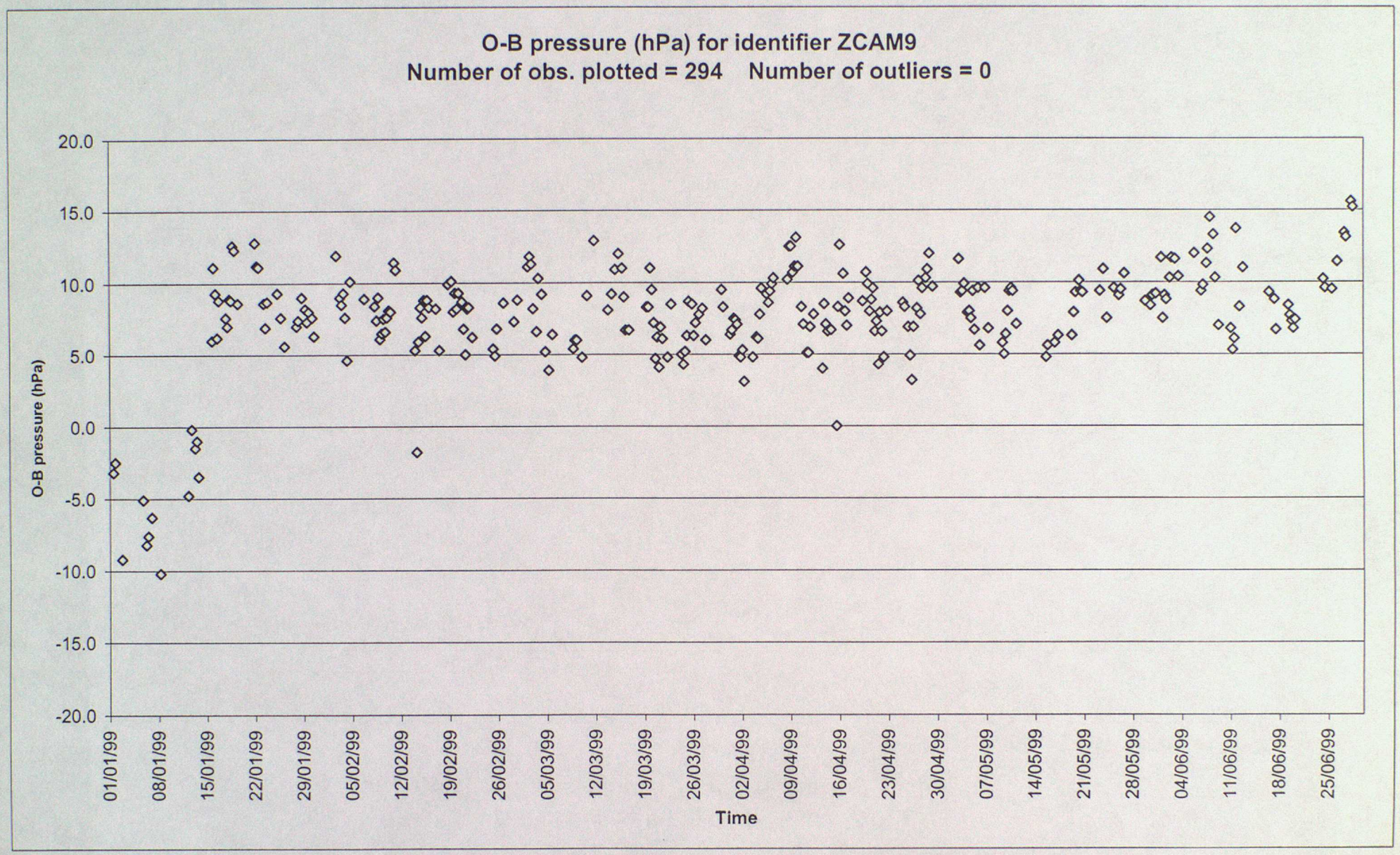

O-B pressure (hPa) for identifier V2XO
Number of obs. plotted = 266 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

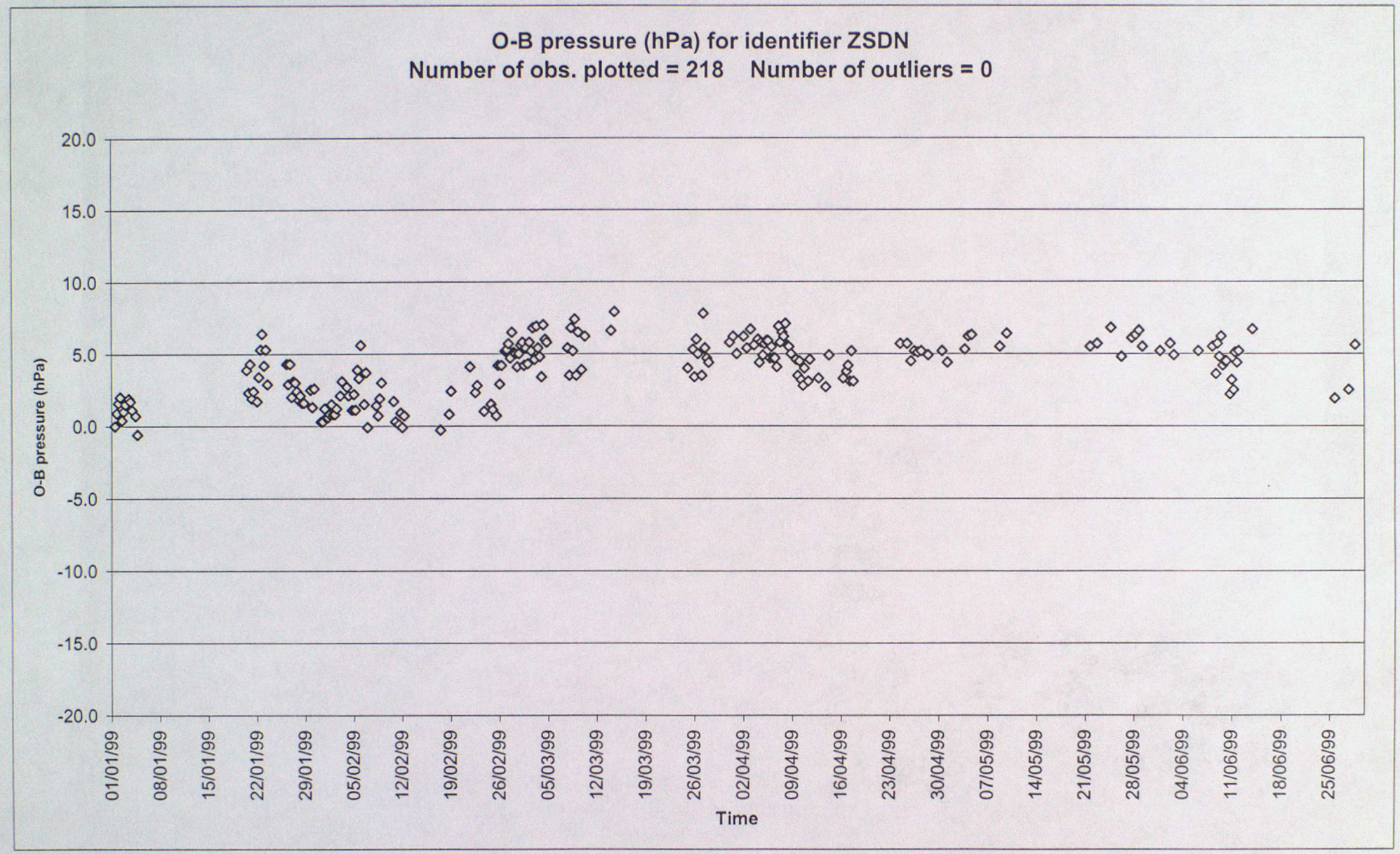

O-B pressure (hPa) for identifier V7BI3
Number of obs. plotted = 64 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

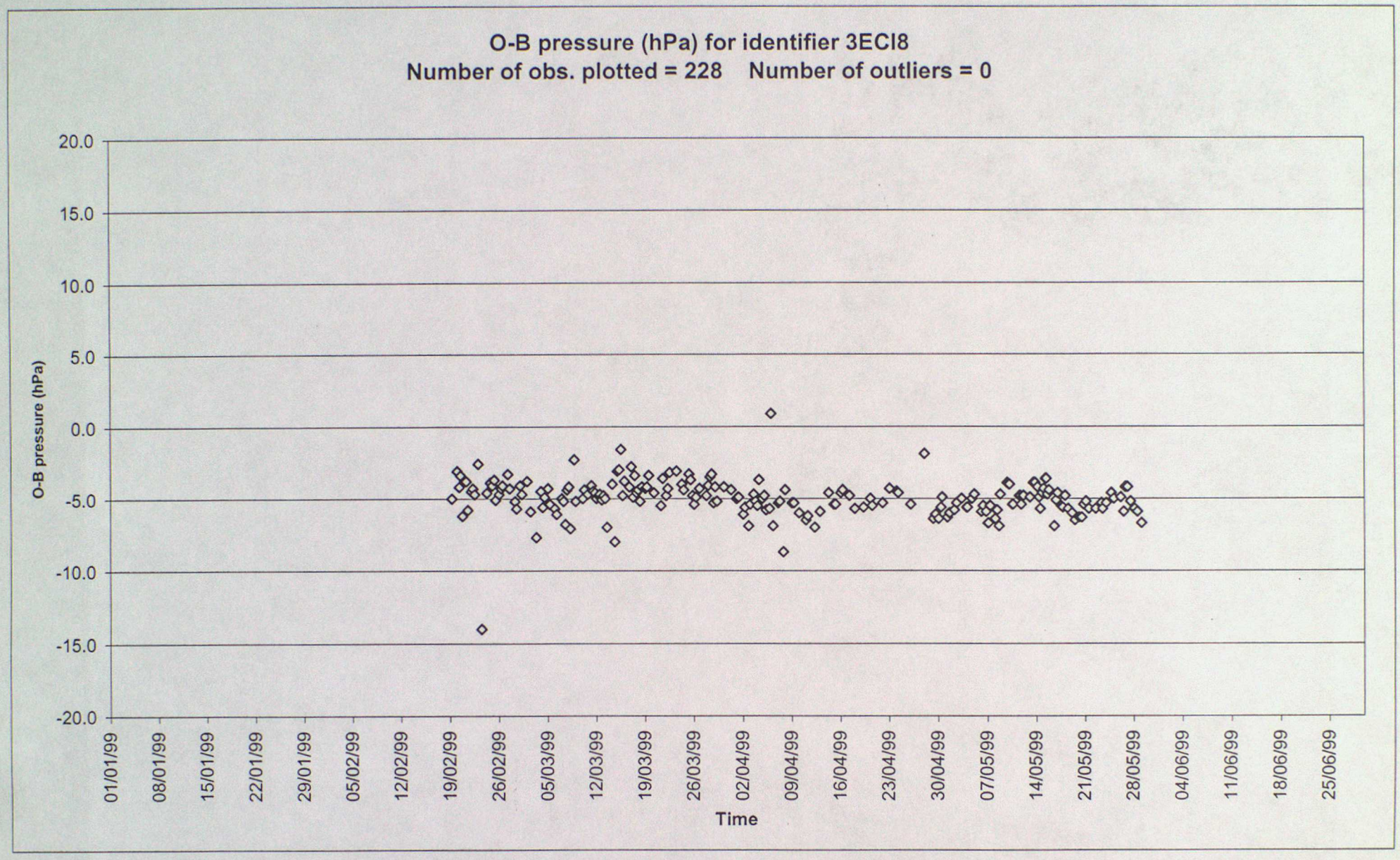

O-B pressure (hPa) for identifier WAV4647
Number of obs. plotted = 44 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

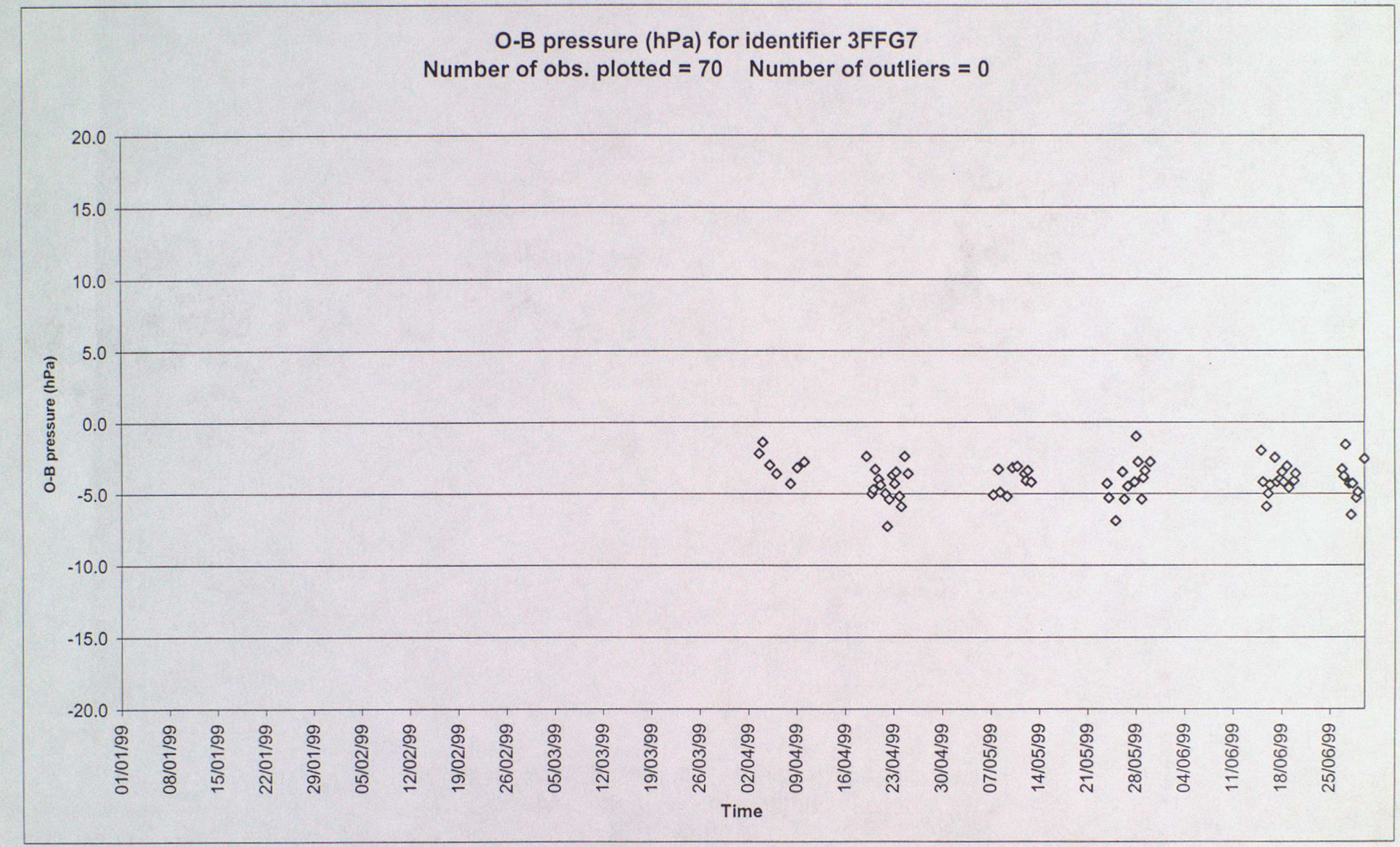

O-B pressure (hPa) for identifier WDZB
Number of obs. plotted = 224 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

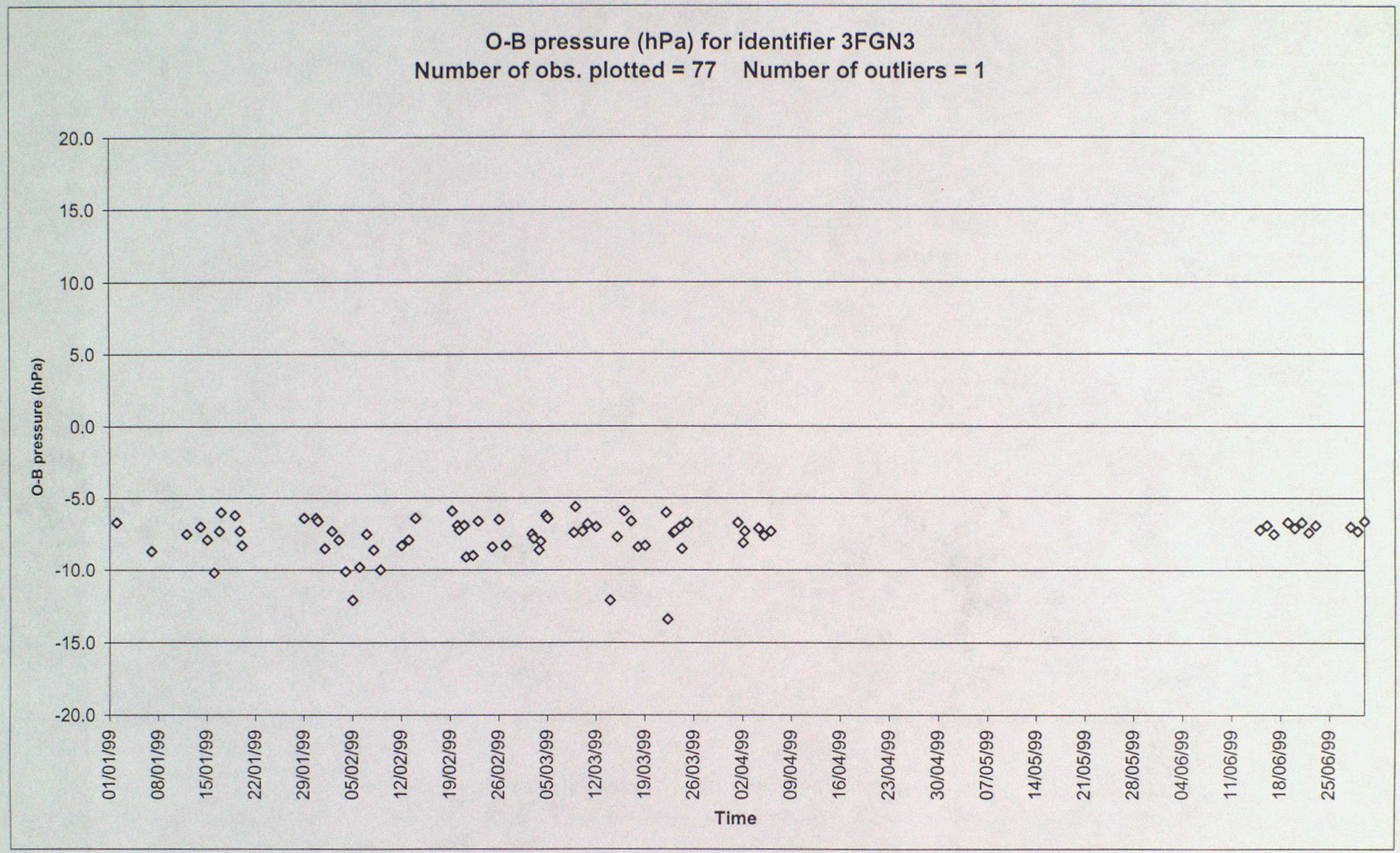

O-B pressure (hPa) for identifier WDZG
Number of obs. plotted = 156 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

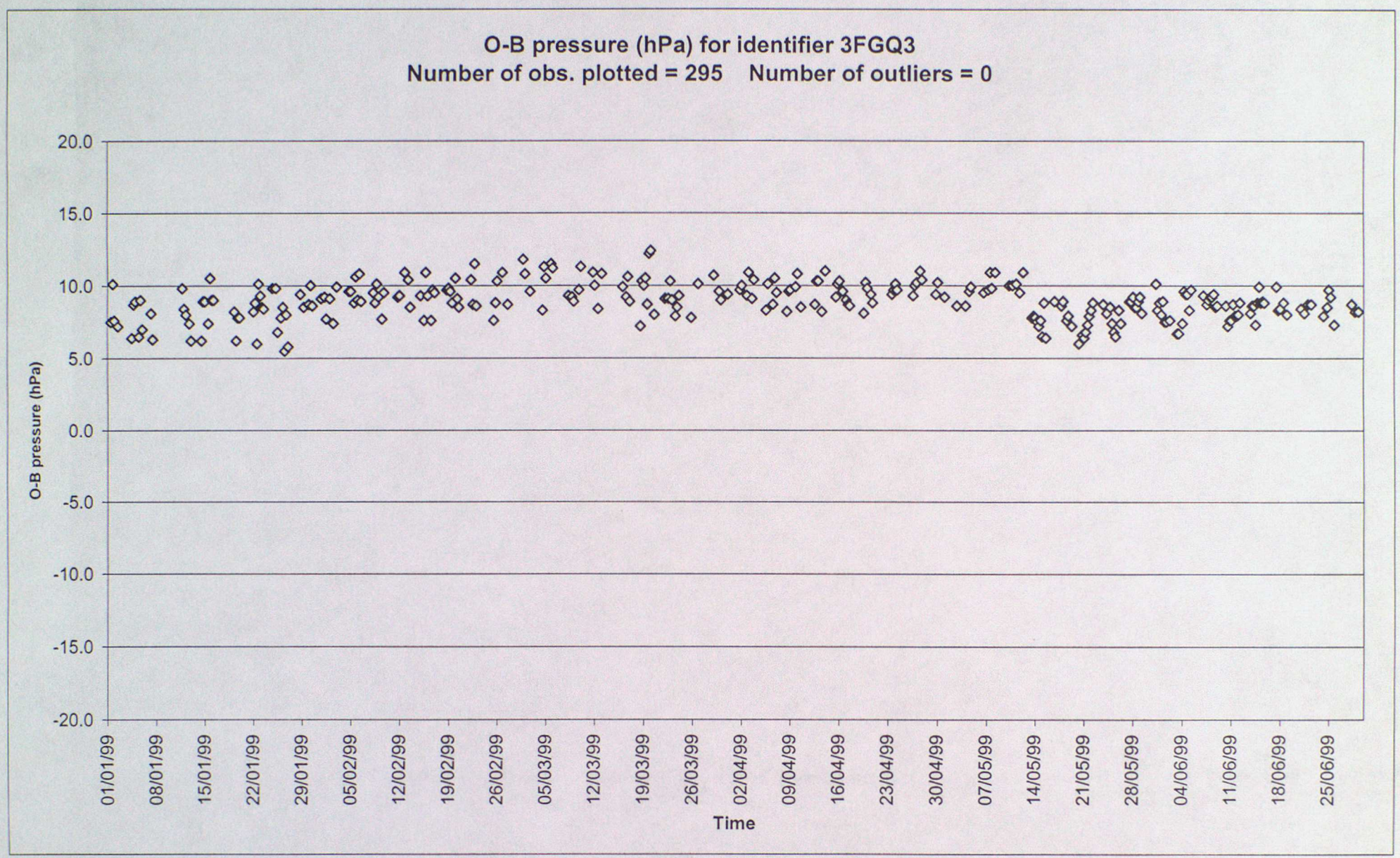

O-B pressure (hPa) for identifier ZCAM9
Number of obs. plotted = 294 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

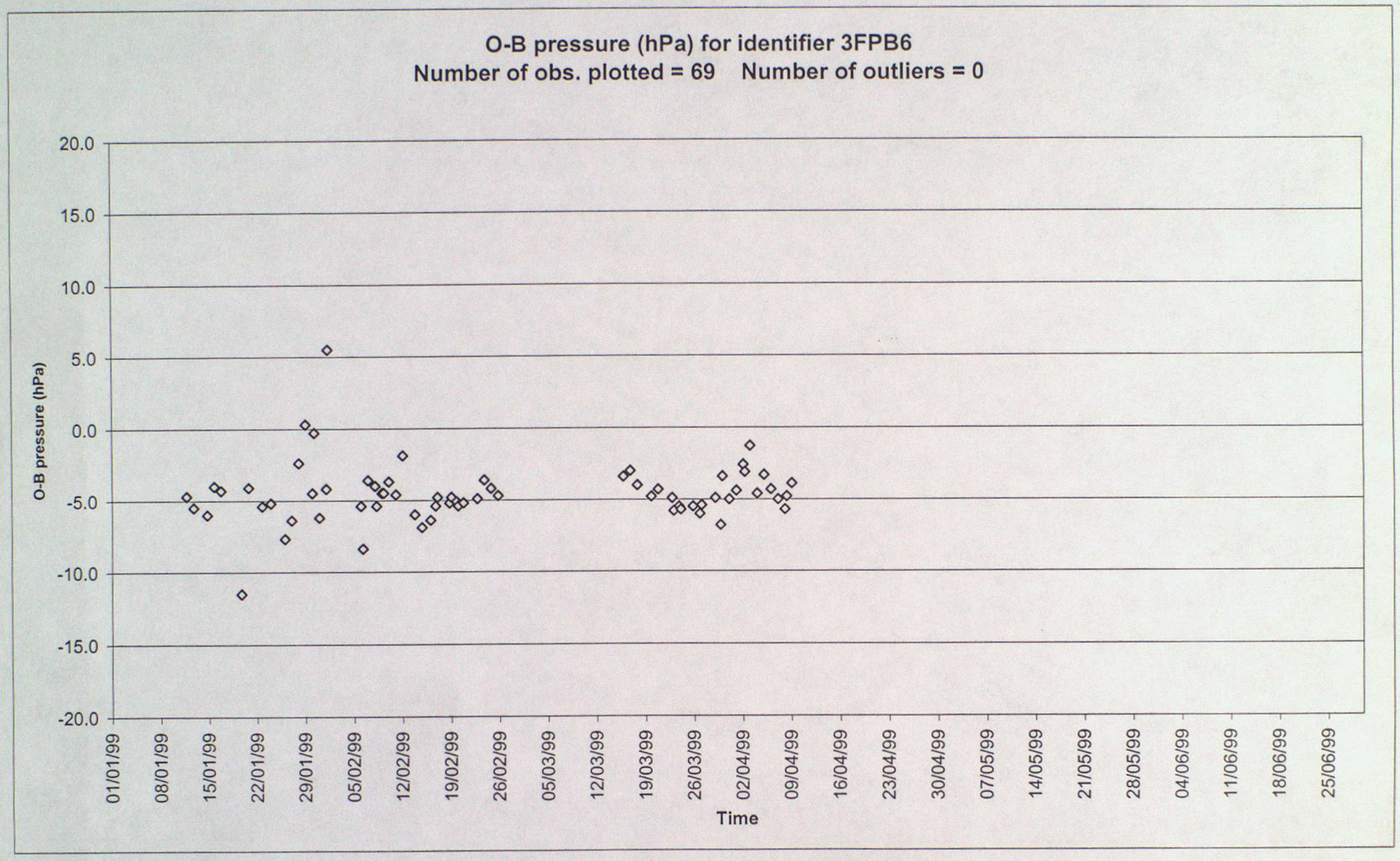

O-B pressure (hPa) for identifier ZSDN
Number of obs. plotted = 218 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

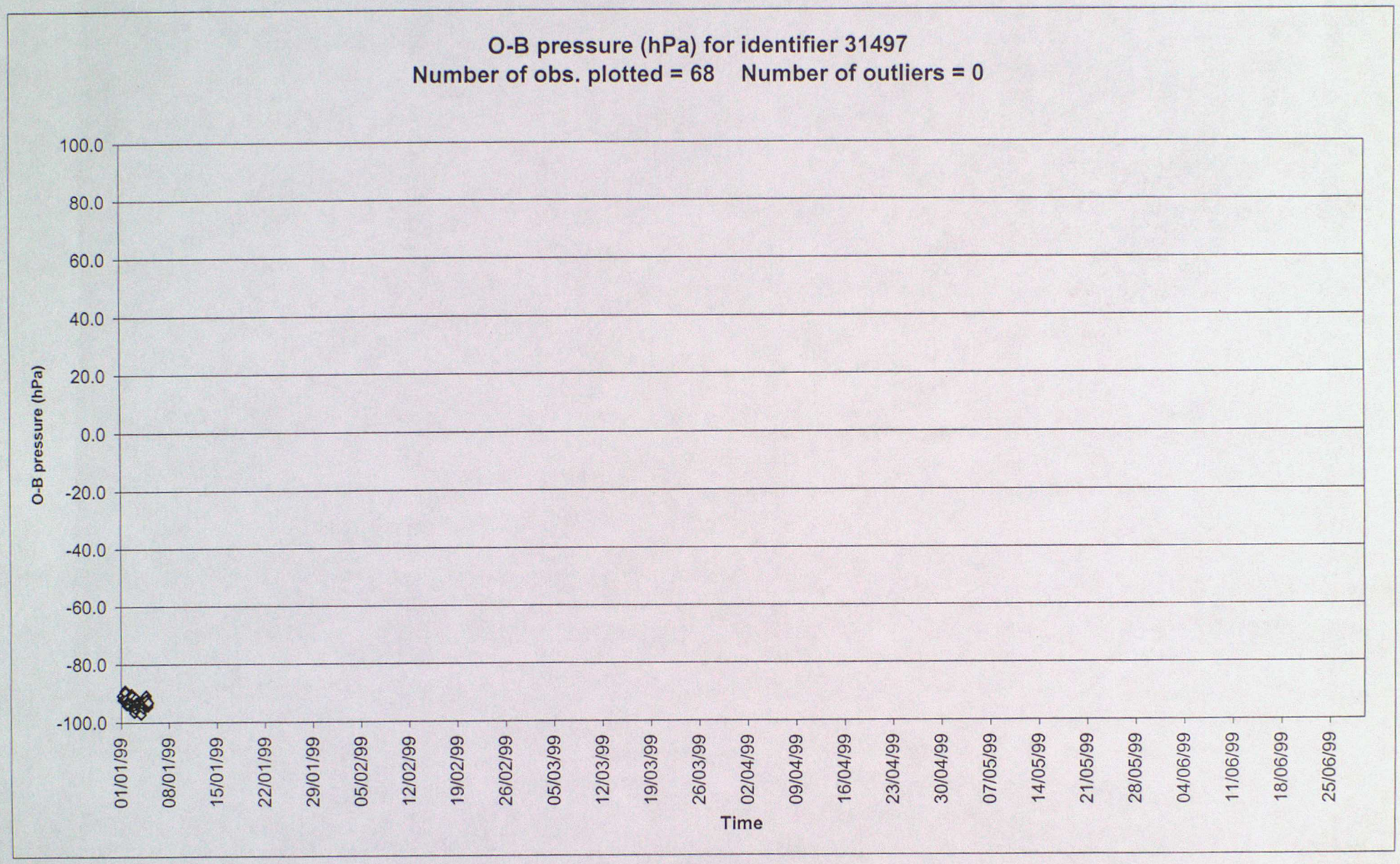

O-B pressure (hPa) for identifier 3ECI8
Number of obs. plotted = 228 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

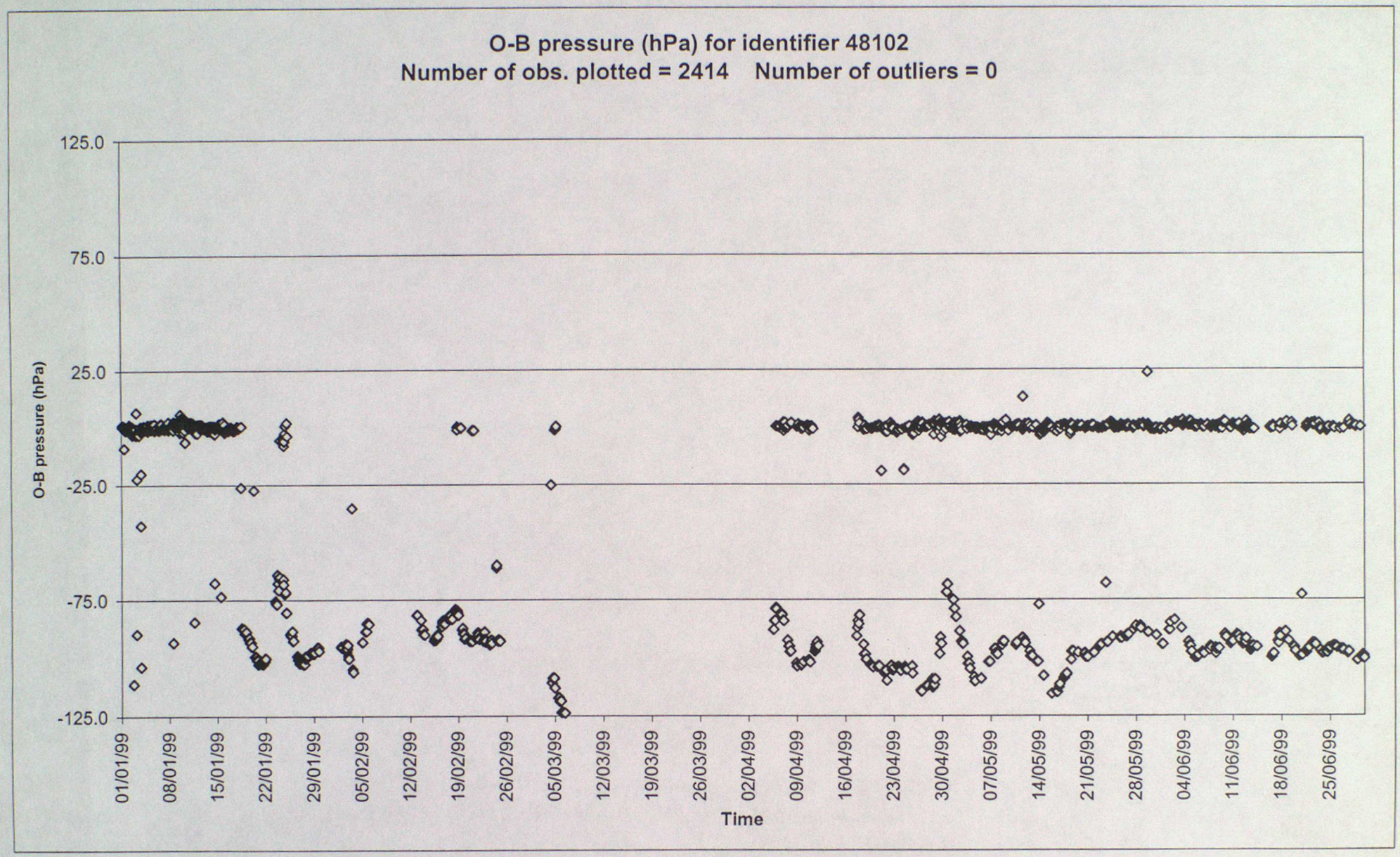

O-B pressure (hPa) for identifier 3FFG7
Number of obs. plotted = 70 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

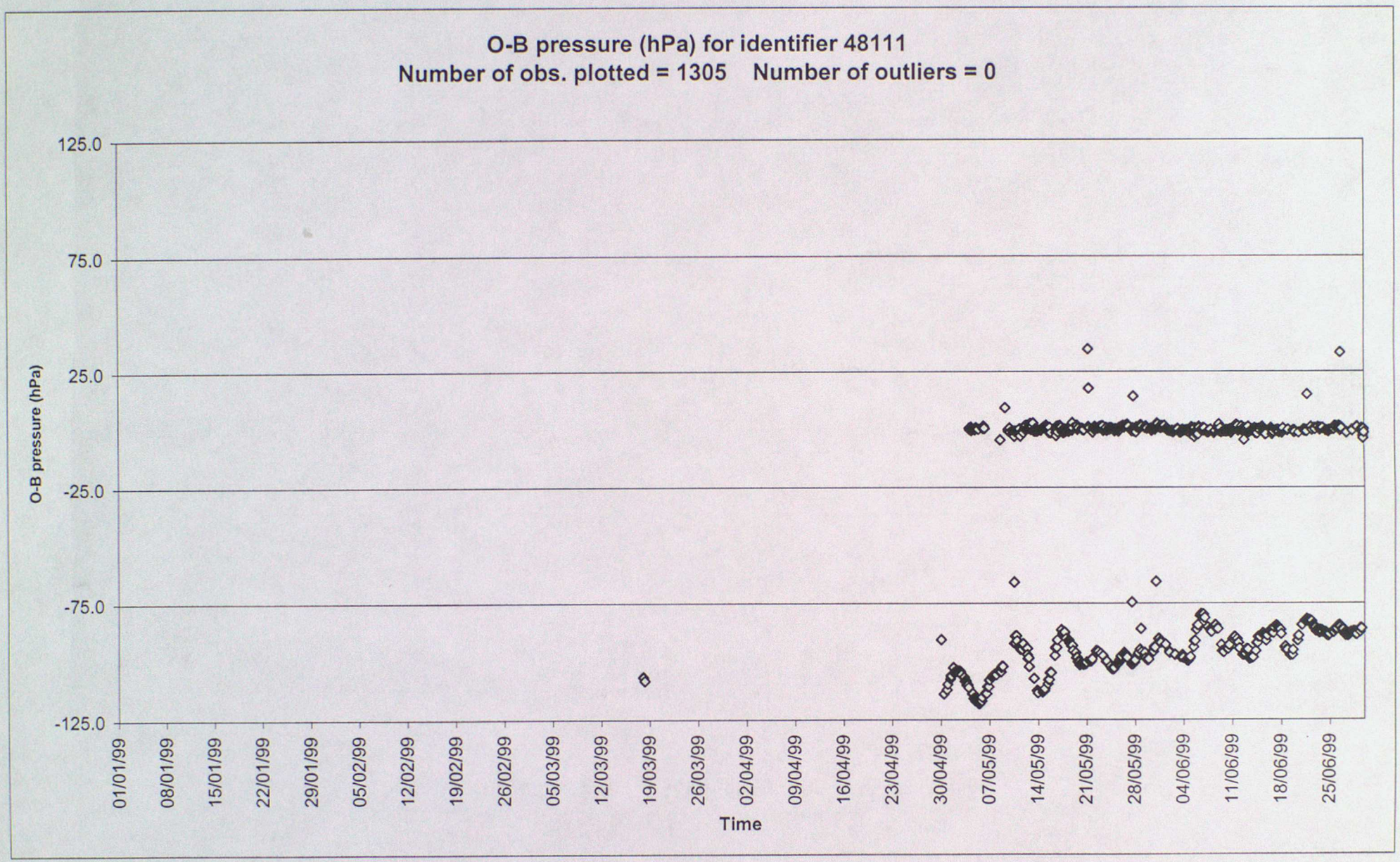

O-B pressure (hPa) for identifier 3FGN3
Number of obs. plotted = 77 Number of outliers = 1
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

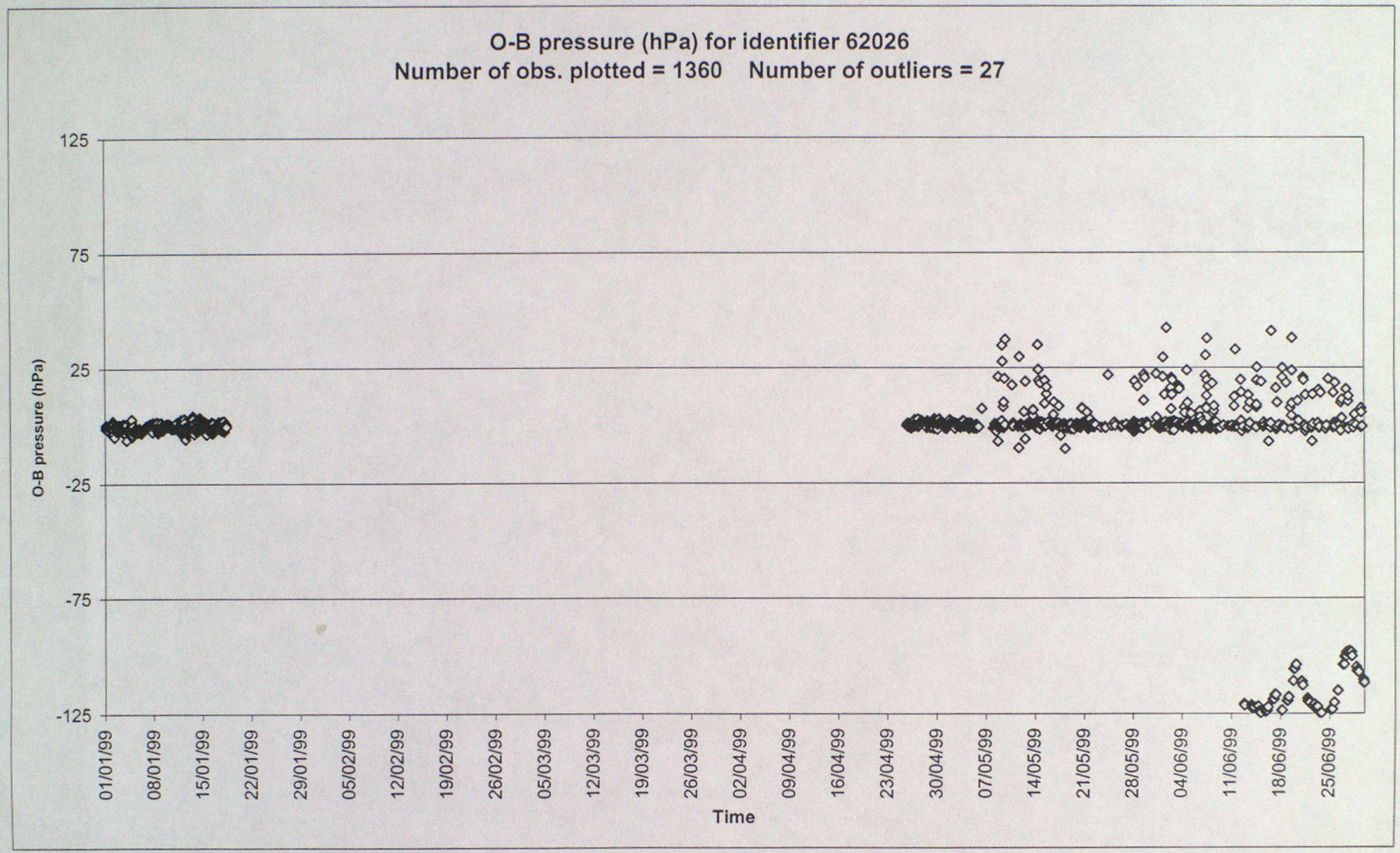

O-B pressure (hPa) for identifier 3FGQ3
Number of obs. plotted = 295 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

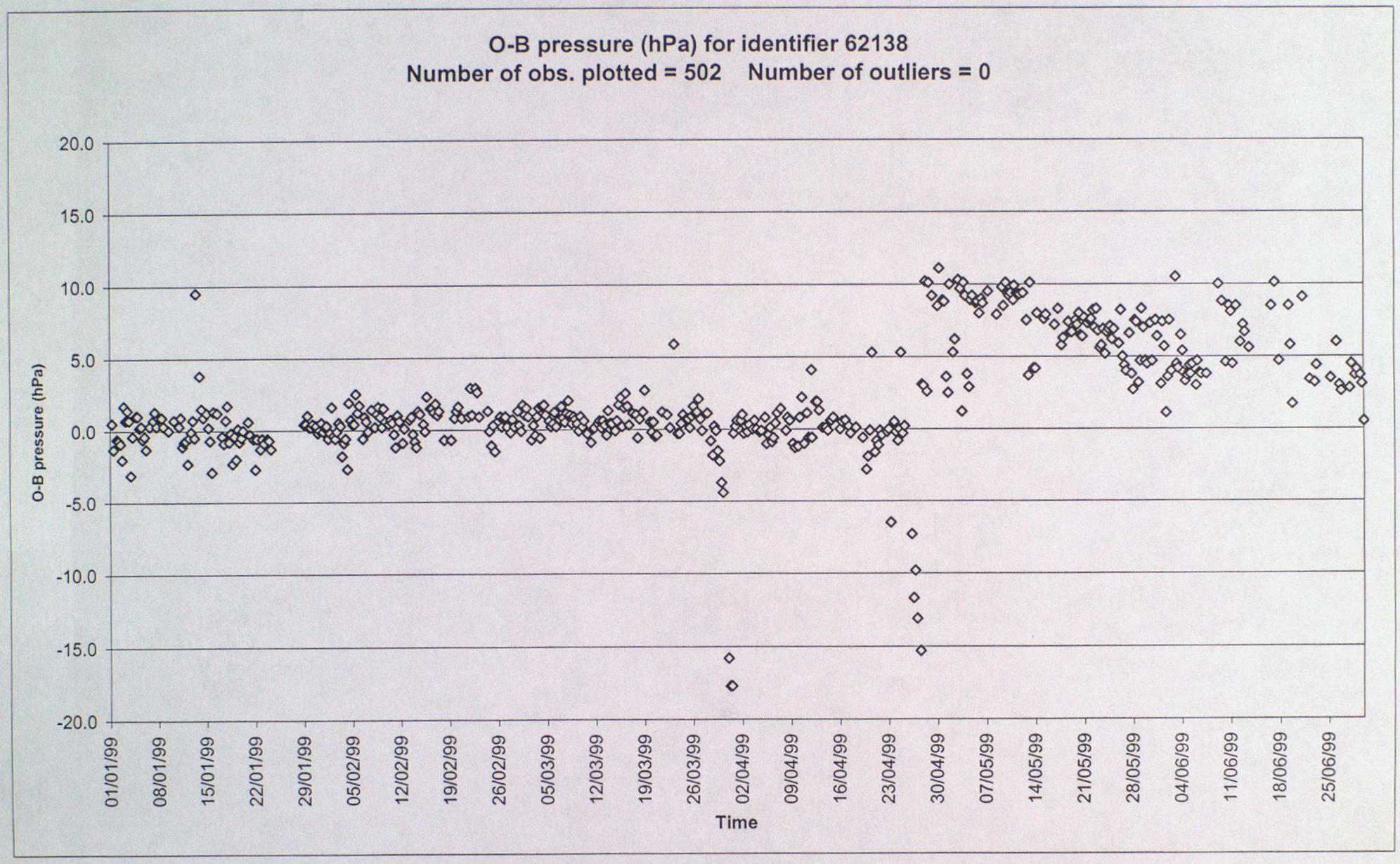

O-B pressure (hPa) for identifier 3FPB6
Number of obs. plotted = 69 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

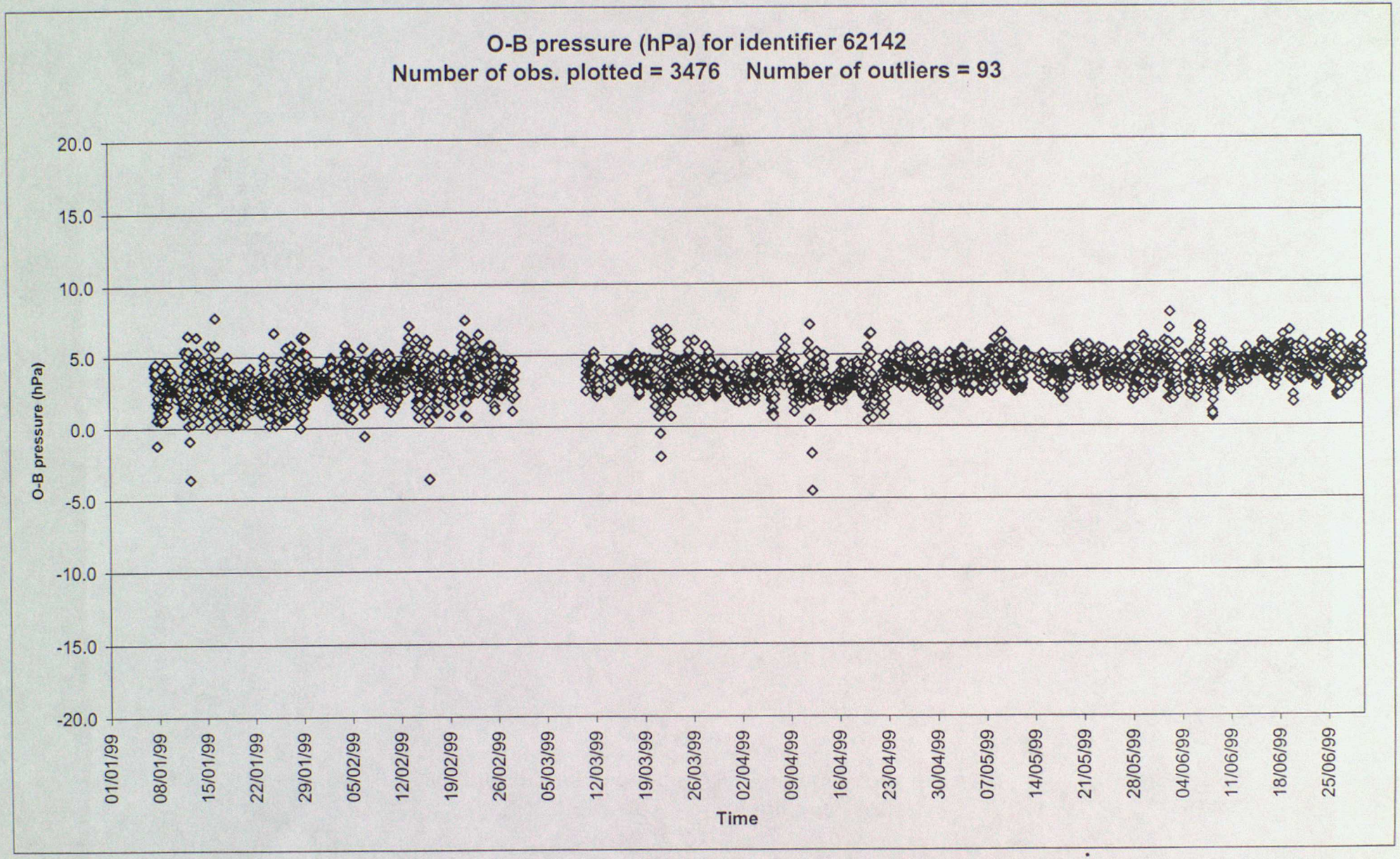

O-B pressure (hPa) for identifier 31497
Number of obs. plotted = 68 Number of outliers = 0
O-B pressure (hPa)
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

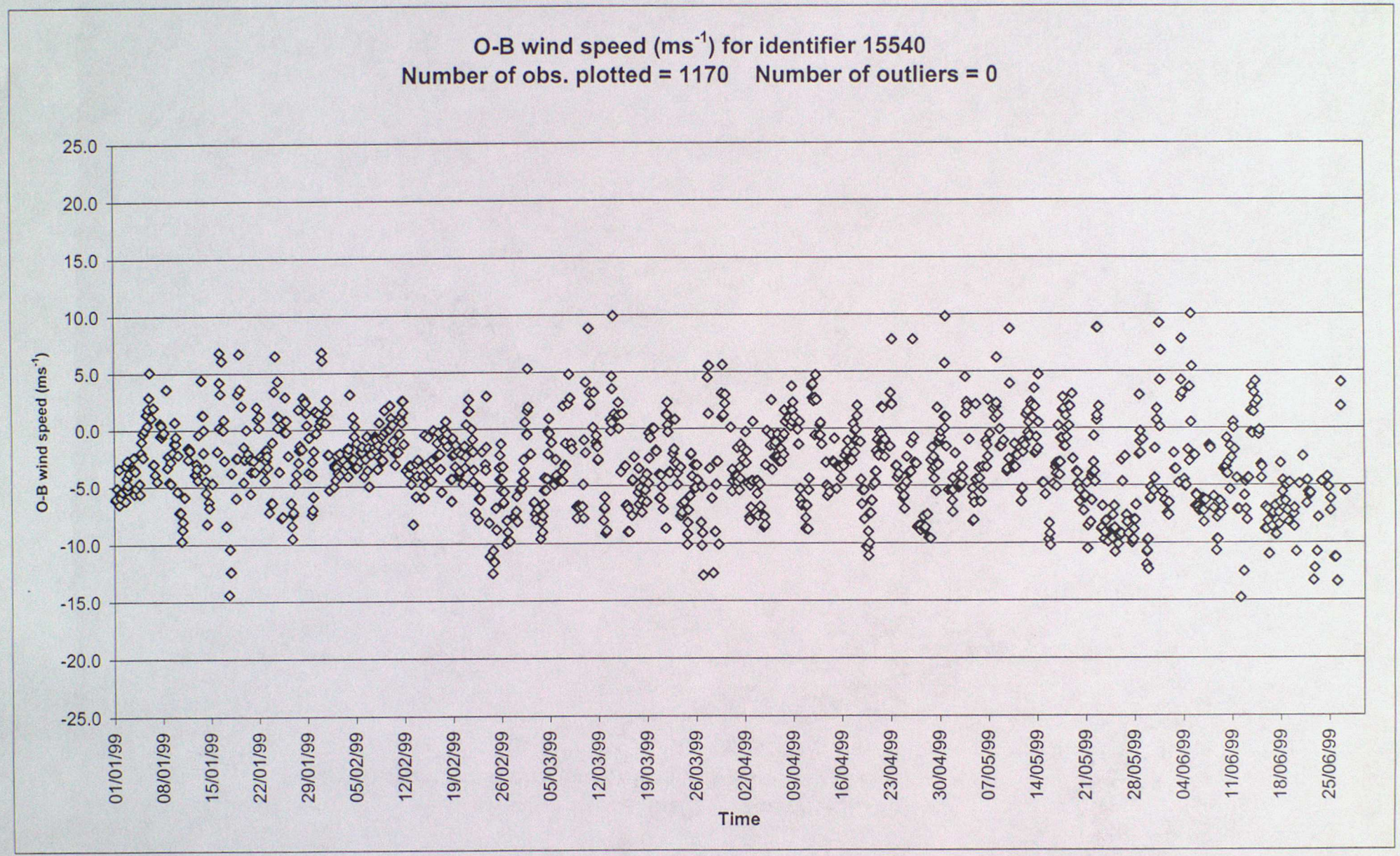

O-B pressure (hPa) for identifier 48102
Number of obs. plotted = 2414 Number of outliers = 0
O-B pressure (hPa)
125.0
75.0
25.0
-25.0
-75.0
-125.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

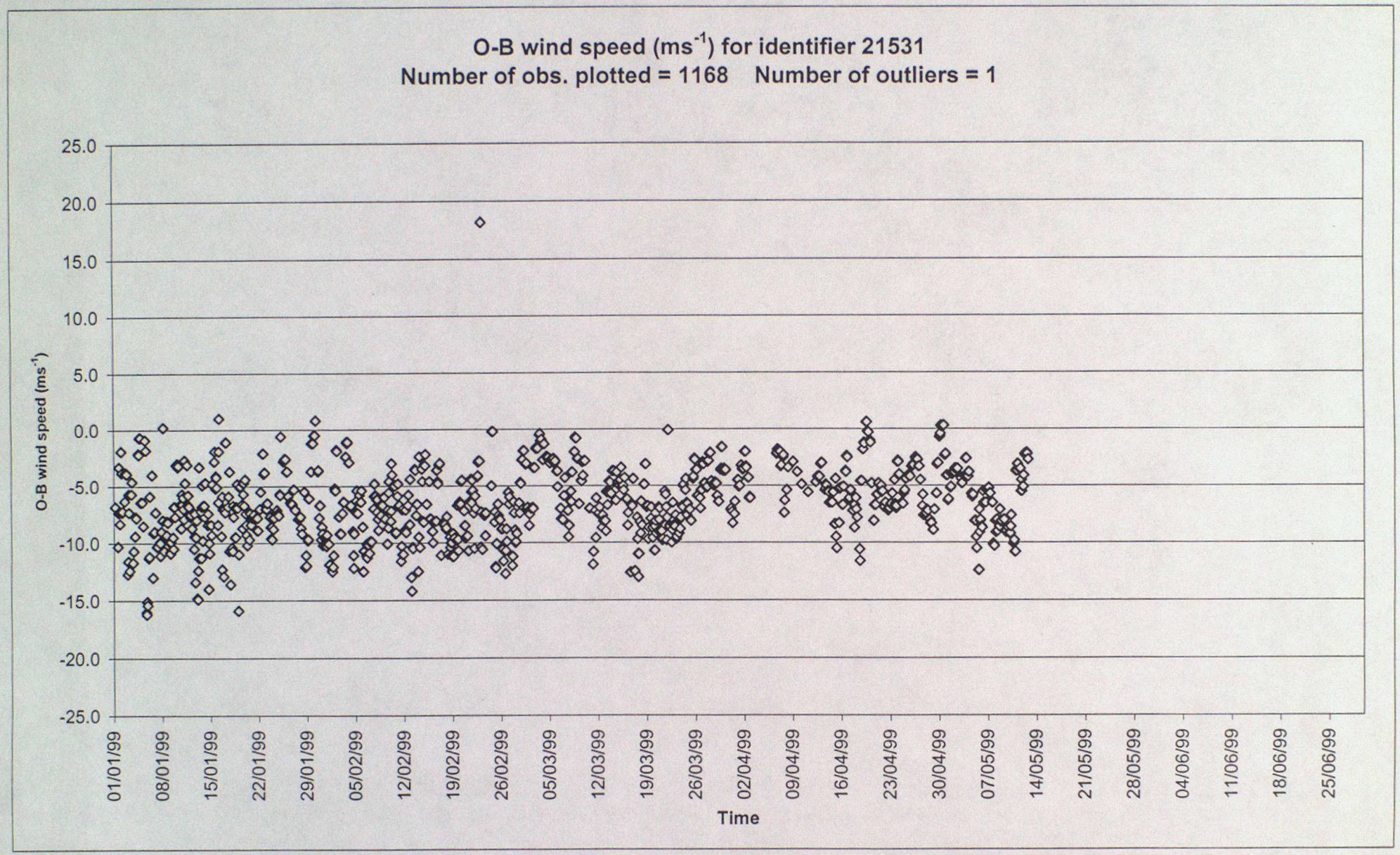

O-B pressure (hPa) for identifier 48111
Number of obs. plotted = 1305 Number of outliers = 0
O-B pressure (hPa)
125.0
75.0
25.0
-25.0
-75.0
-125.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B pressure (hPa) for identifier 62026
Number of obs. plotted = 1360 Number of outliers = 27
O-B pressure (hPa)
125
75
25
-25
-75
-125
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

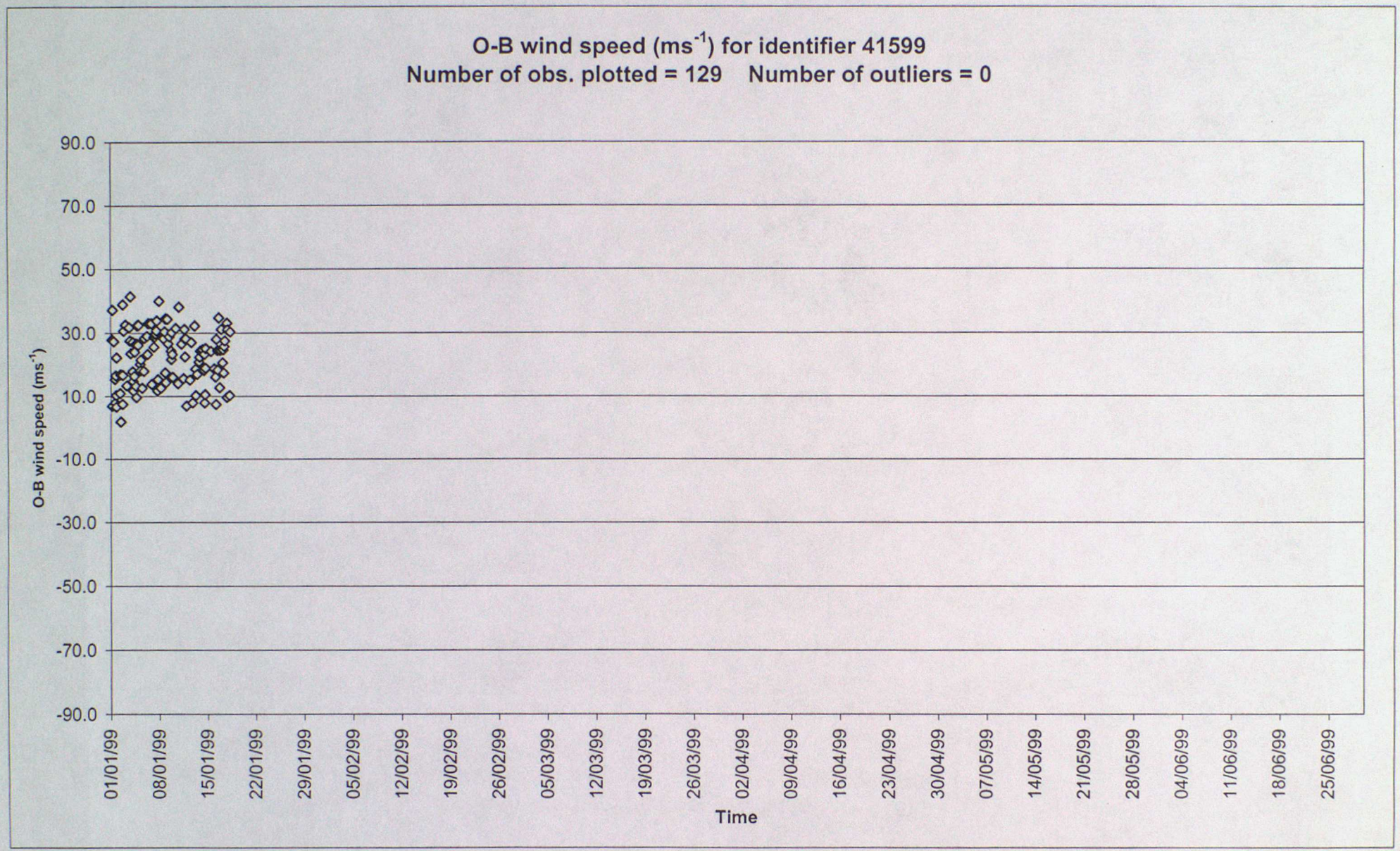

O-B pressure (hPa) for identifier 62138
Number of obs. plotted = 502 Number of outliers = 0
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

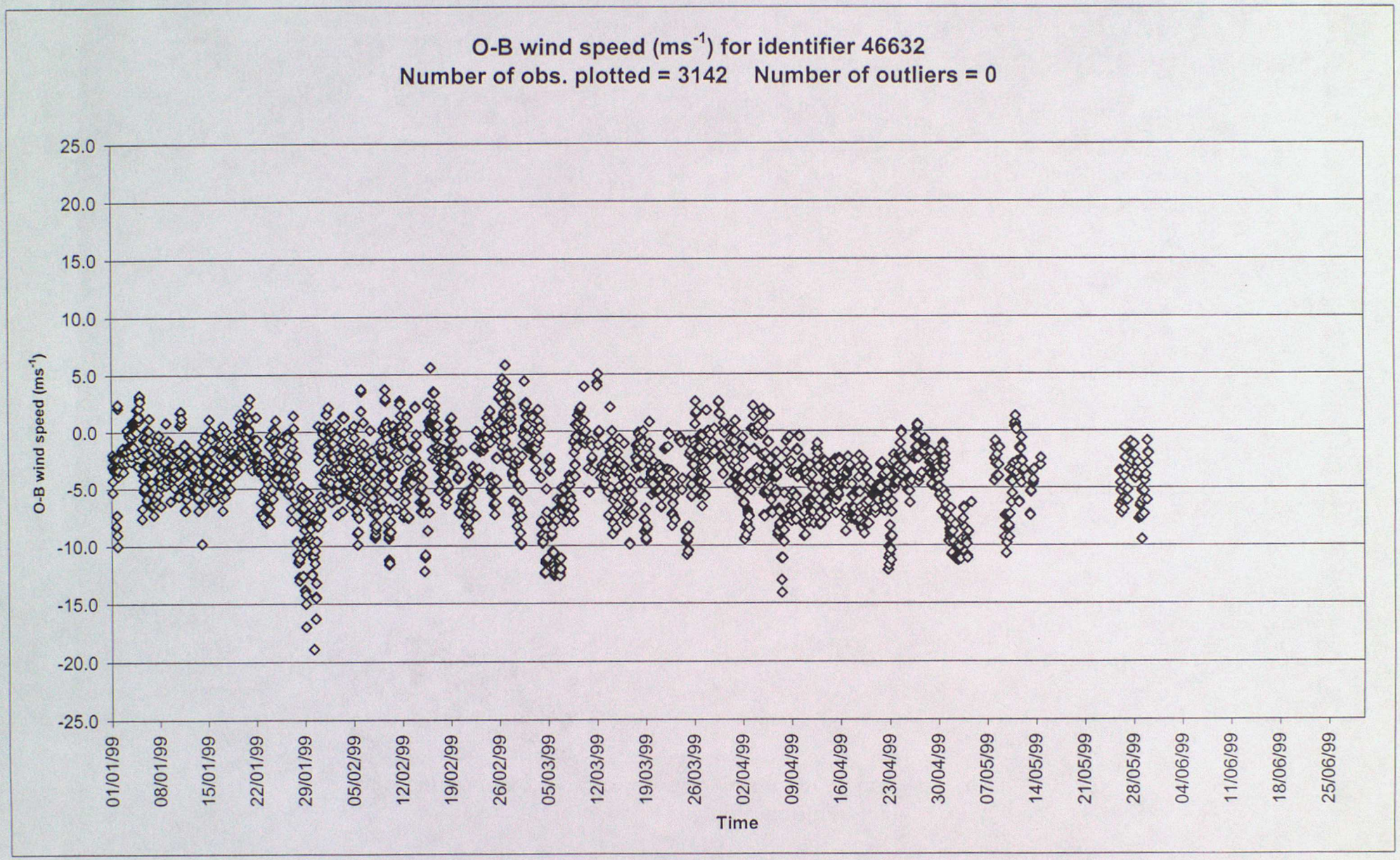

O-B pressure (hPa) for identifier 62142
Number of obs. plotted = 3476 Number of outliers = 93
O-B pressure (hPa)
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

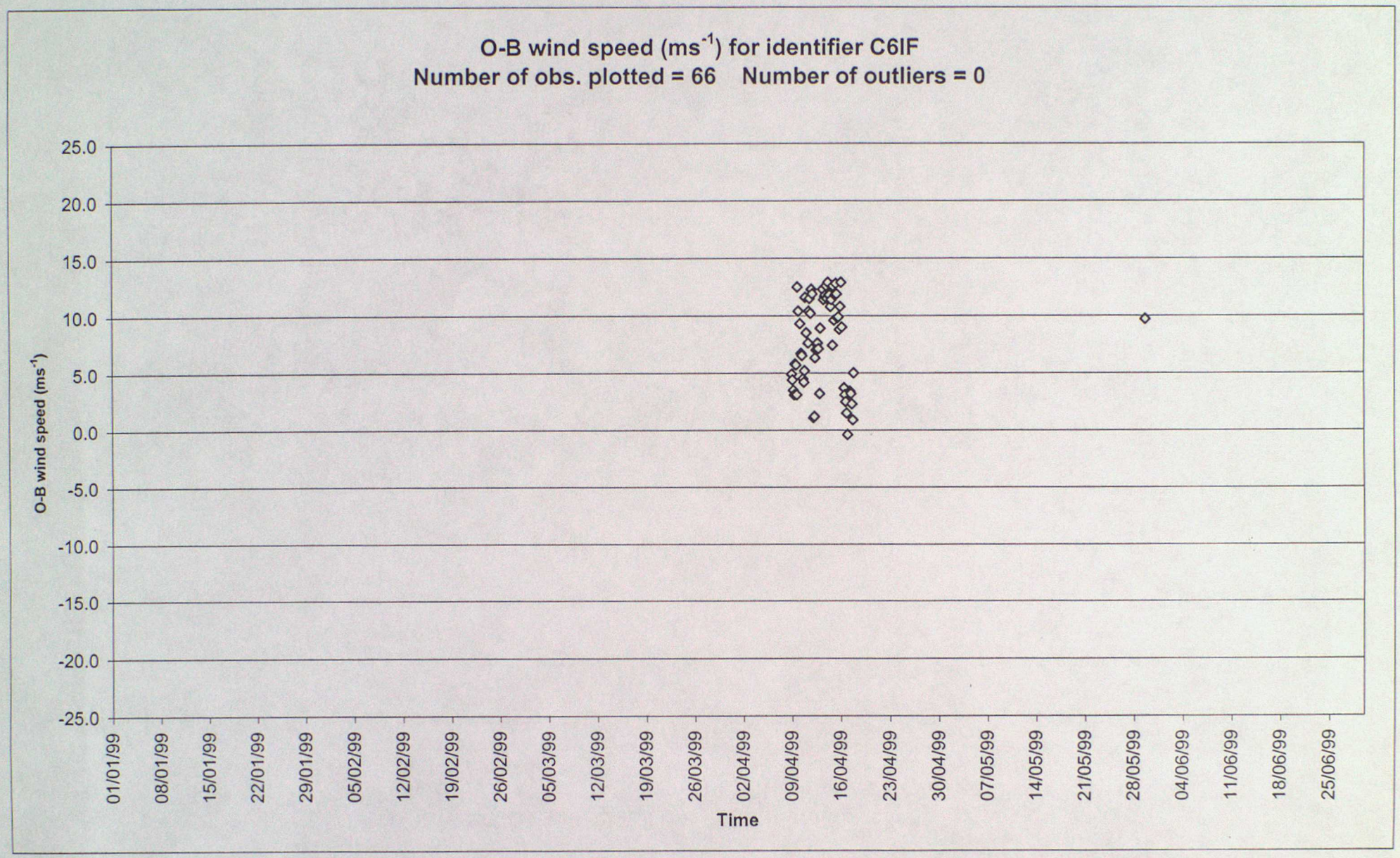

O-B wind speed (ms-1) for identifier 15540
Number of obs. plotted = 1170 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind speed (ms-1) for identifier 21531
Number of obs. plotted = 1168 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

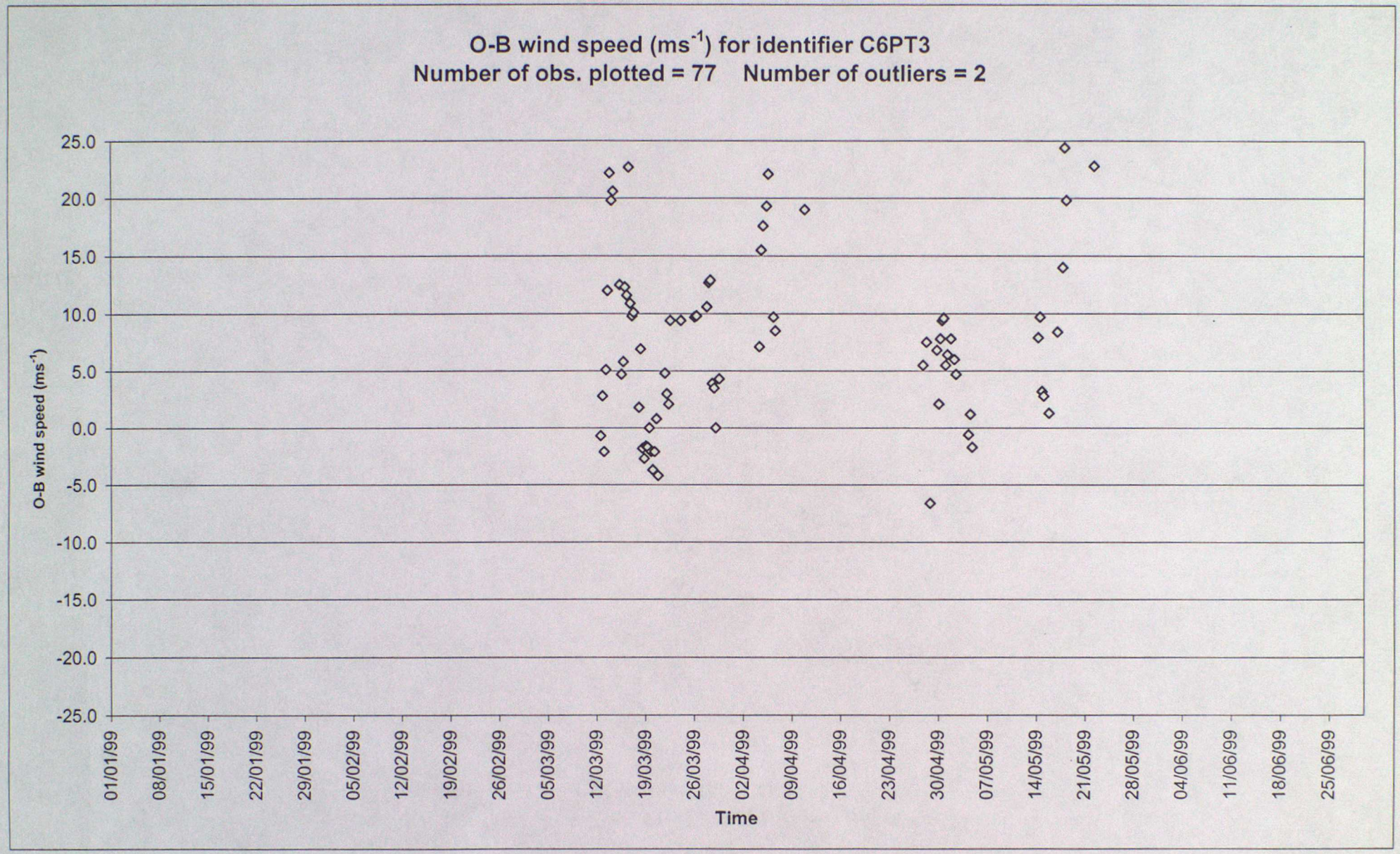
O-B wind speed (ms-1) for identifier 41522
Number of obs. plotted = 107 Number of outliers = 0
O-B wind speed (ms-1)
90.0
70.0
50.0
30.0
10.0
-10.0
-30.0
-50.0
-70.0
-90.0
Time
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99

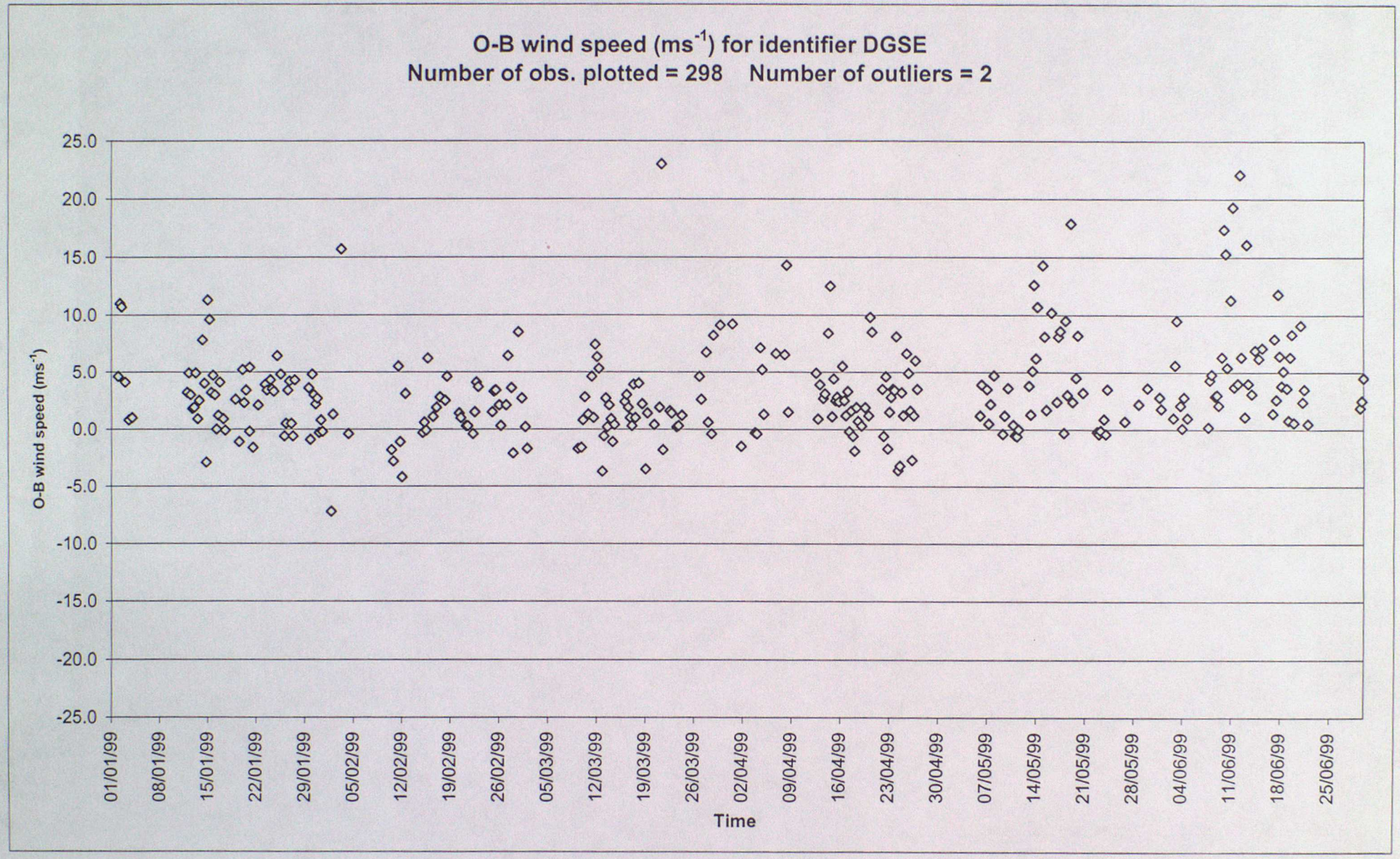

O-B wind speed (ms-1) for identifier 41599
Number of obs. plotted = 129 Number of outliers = 0
O-B wind speed (ms-1)
90.0
70.0
50.0
30.0
10.0
-10.0
-30.0
-50.0
-70.0
-90.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

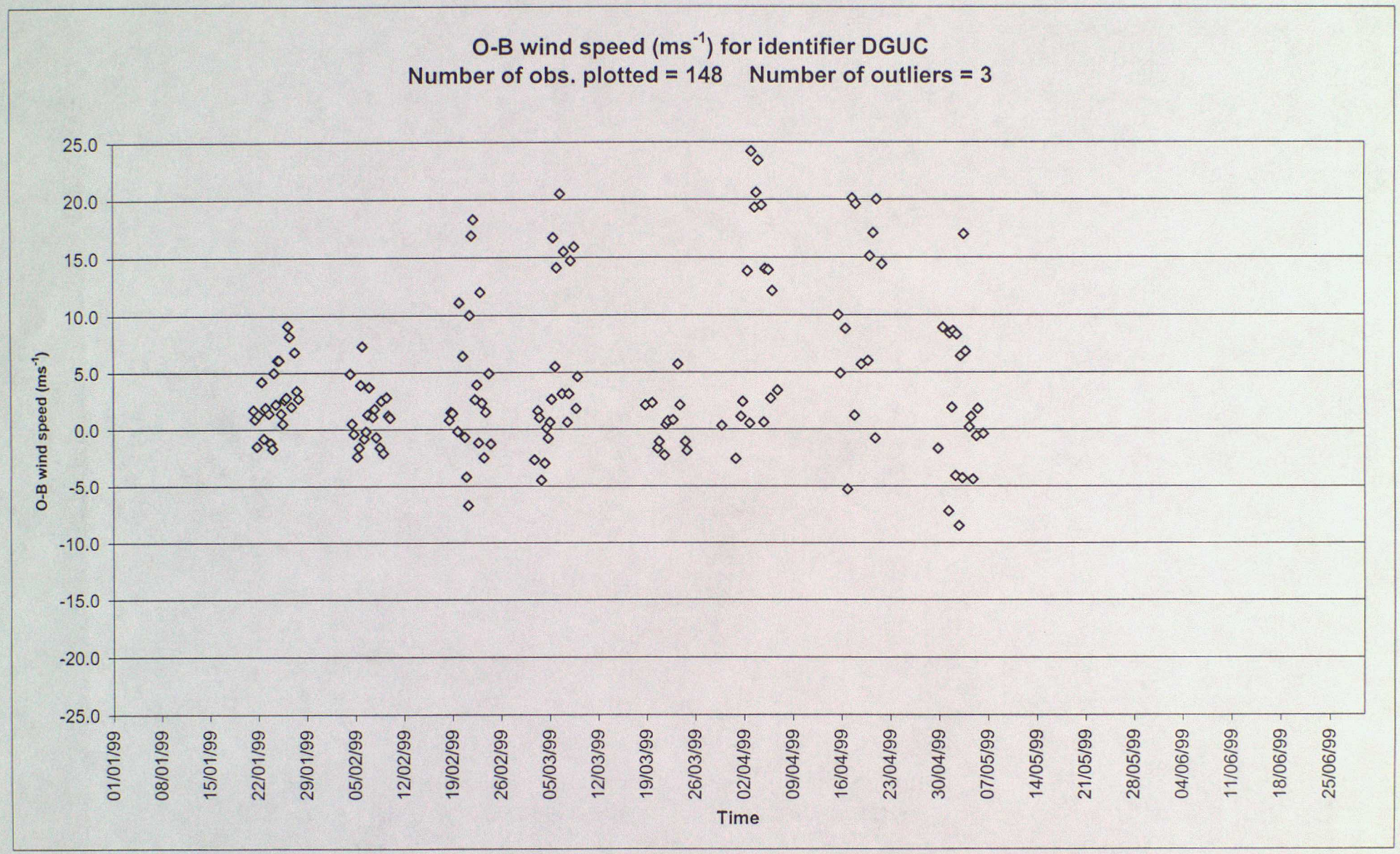

O-B wind speed (ms-1) for identifier 46632
Number of obs. plotted = 3142 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

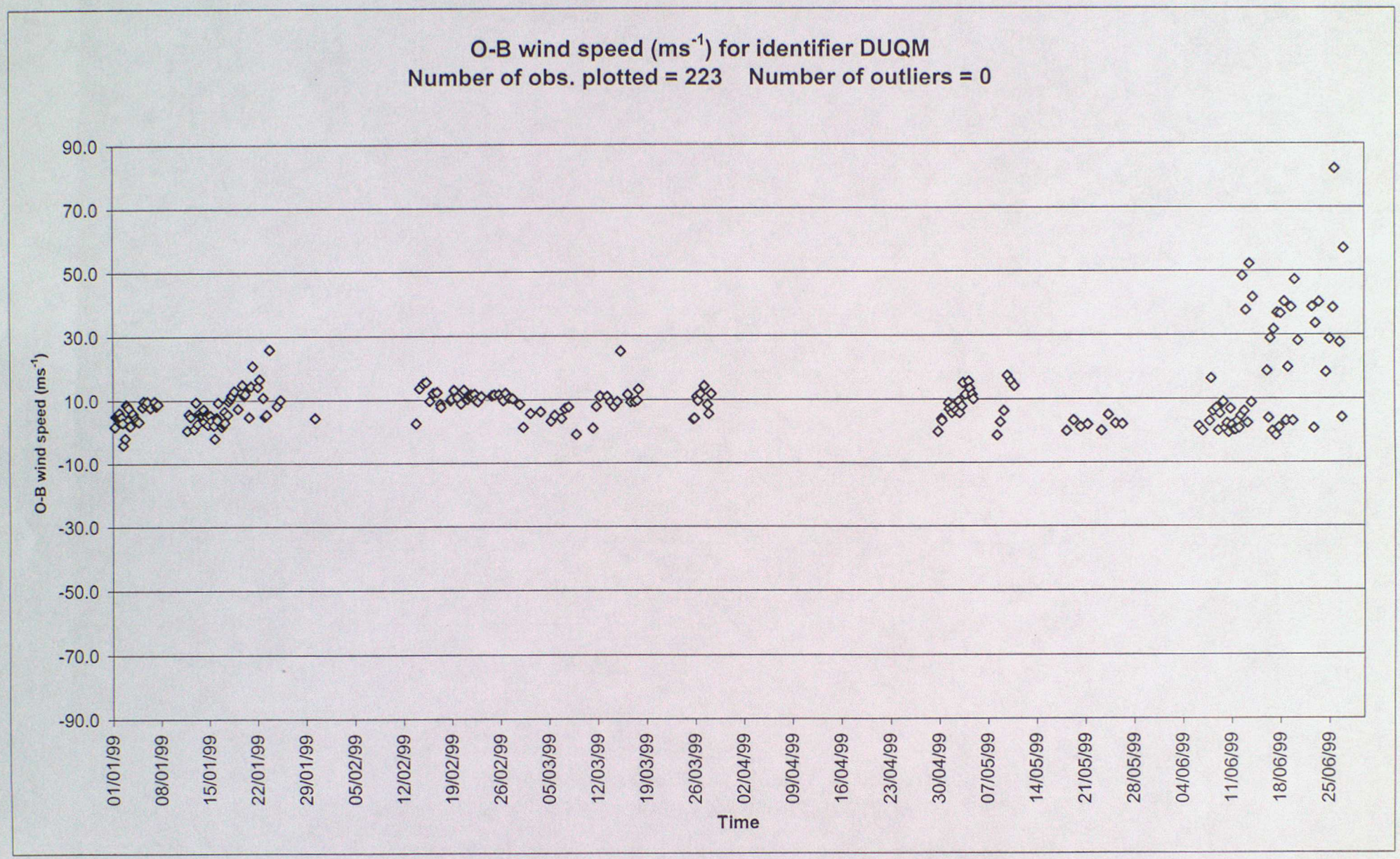

O-B wind speed (ms-1) for identifier C6IF
Number of obs. plotted = 66 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

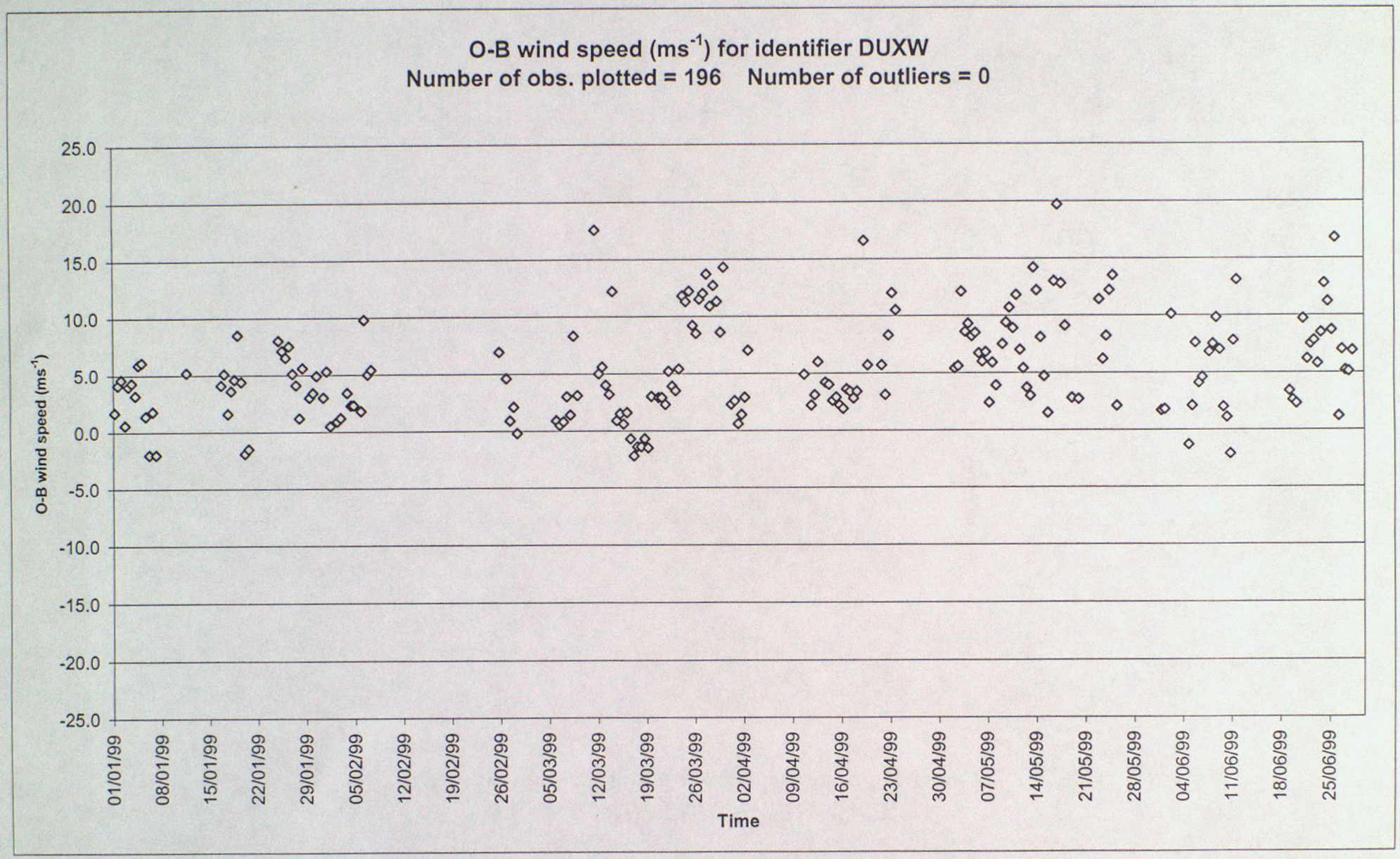
O-B wind speed (ms-1) for identifier C6LQ3
Number of obs. plotted = 150 Number of outliers = 9
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

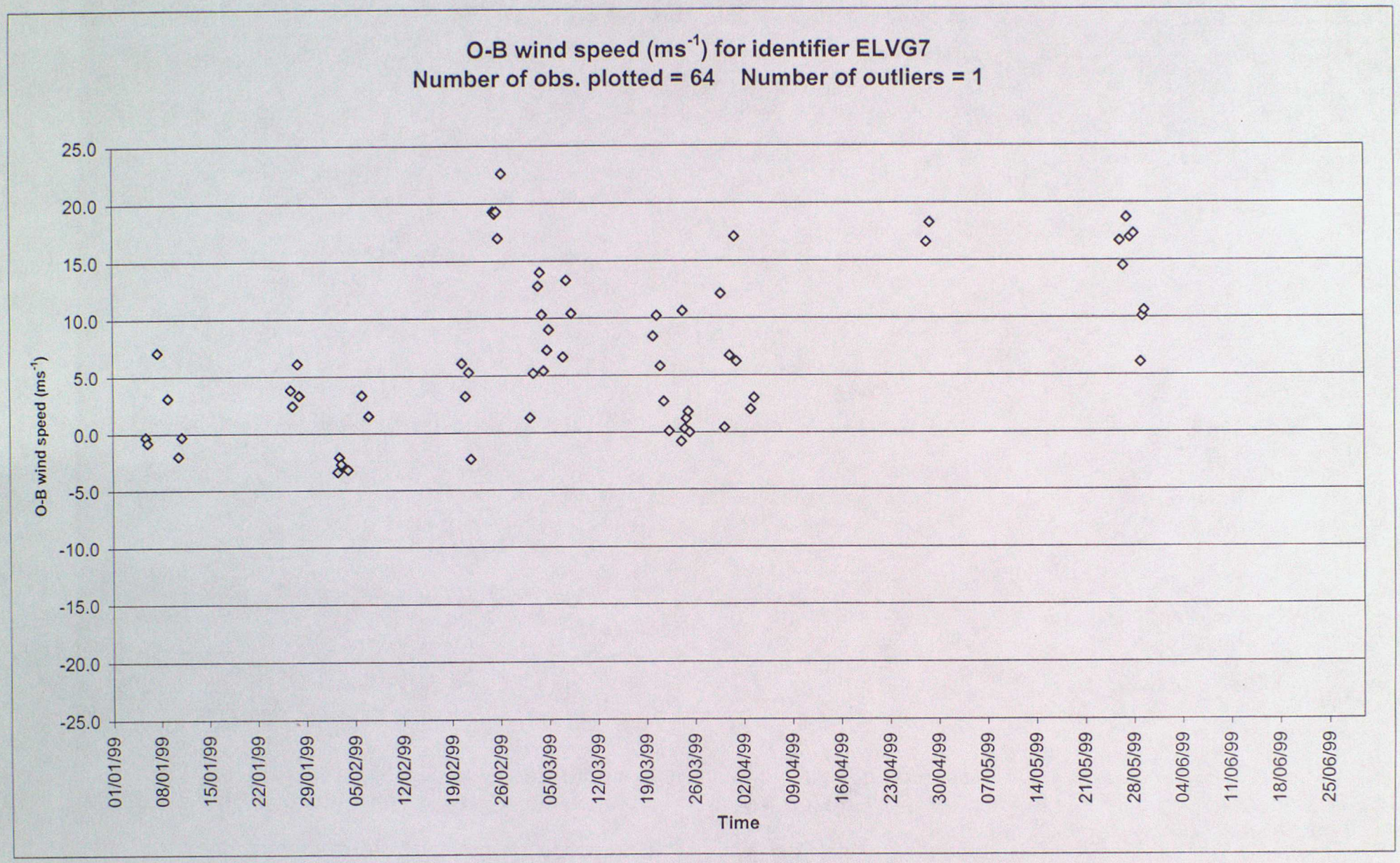

O-B wind speed (ms-1) for identifier C6PT3
Number of obs. plotted = 77 Number of outliers = 2
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

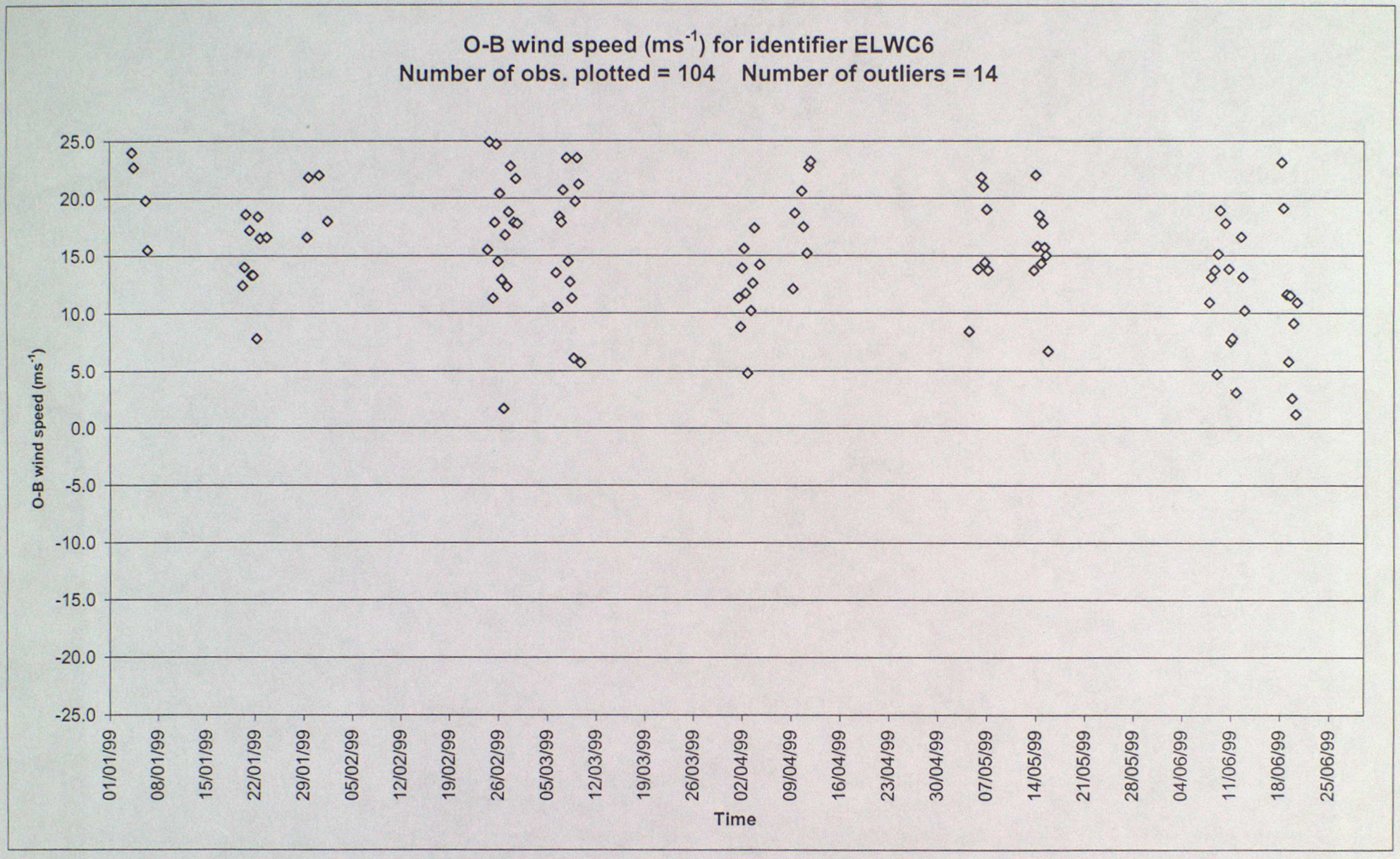

O-B wind speed (ms-1) for identifier DGSE
Number of obs. plotted = 298 Number of outliers = 2
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

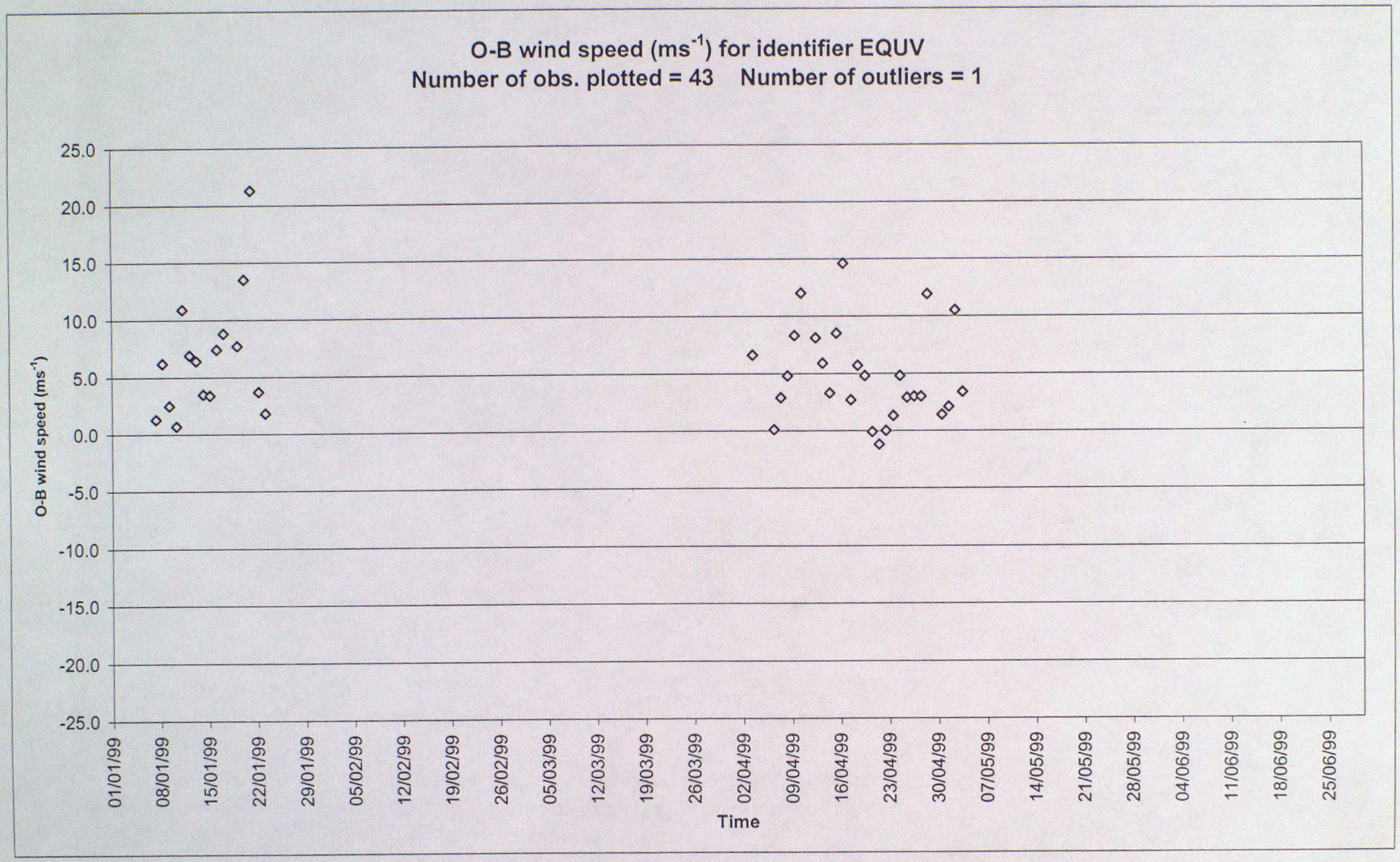

O-B wind speed (ms-1) for identifier DGUC
Number of obs. plotted = 148 Number of outliers = 3
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

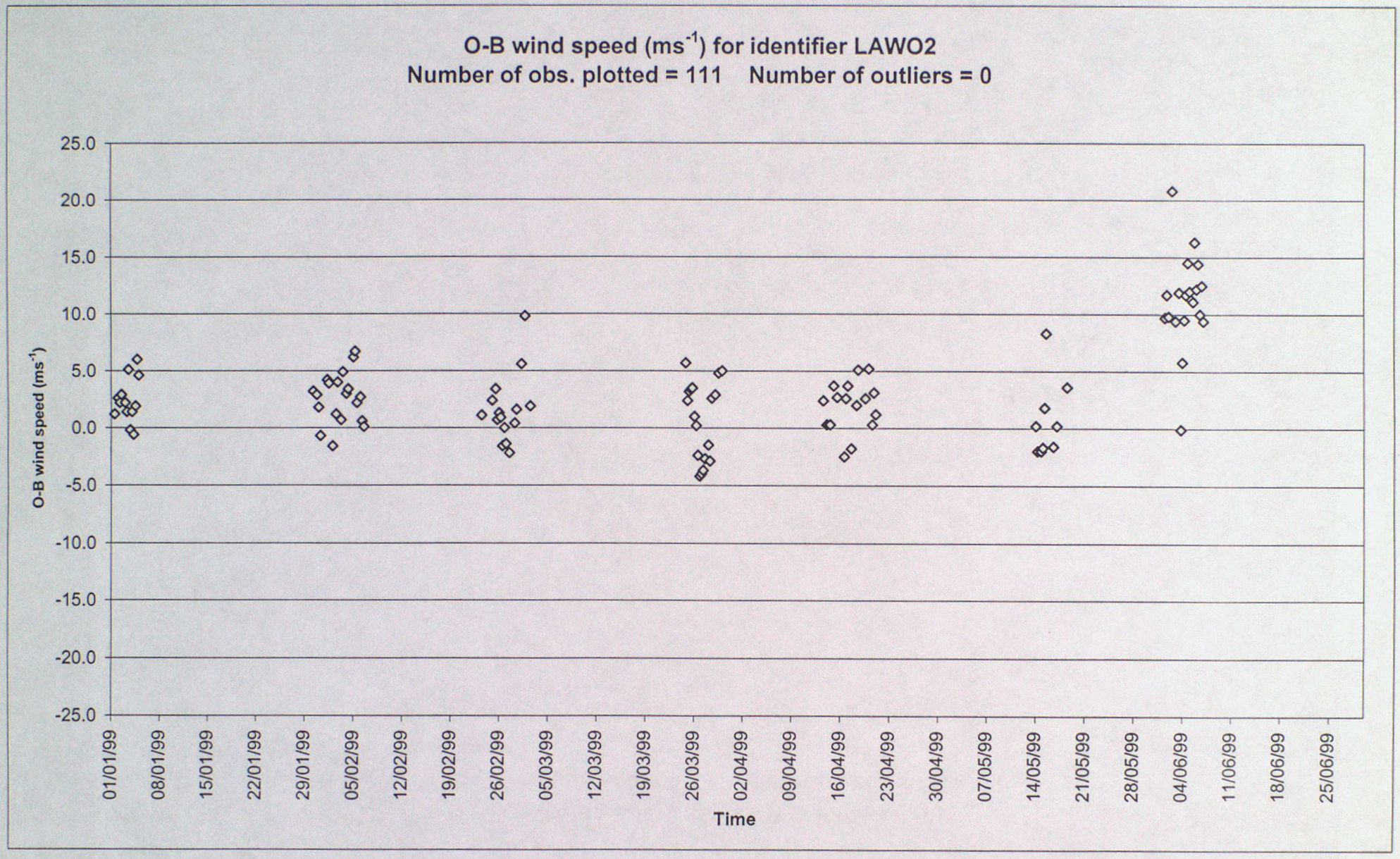

O-B wind speed (ms-1) for identifier DUQM
Number of obs. plotted = 223 Number of outliers = 0
O-B wind speed (ms-1)
90.0
70.0
50.0
30.0
10.0
-10.0
-30.0
-50.0
-70.0
-90.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

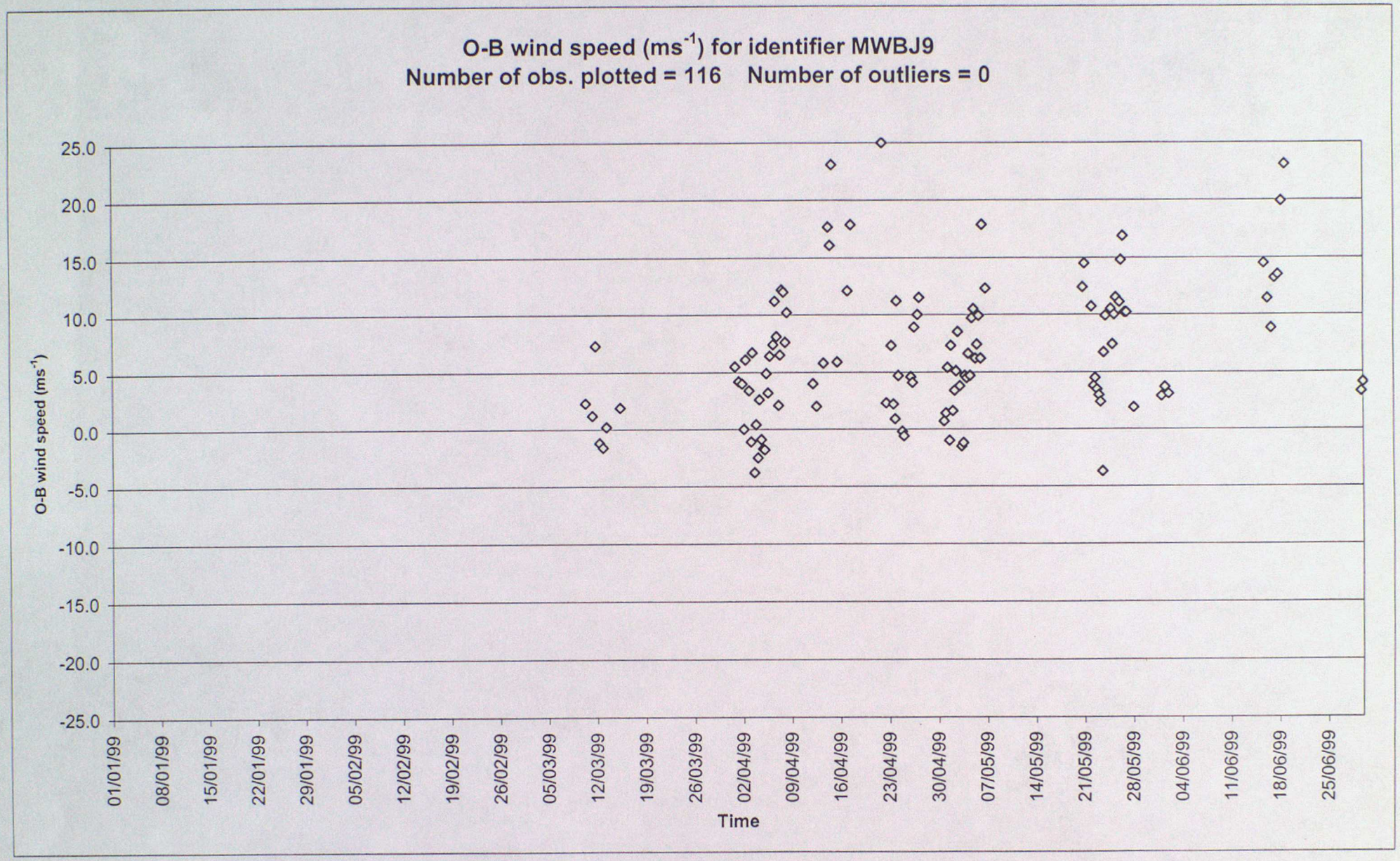

O-B wind speed (ms-1) for identifier DUXW
Number of obs. plotted = 196 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

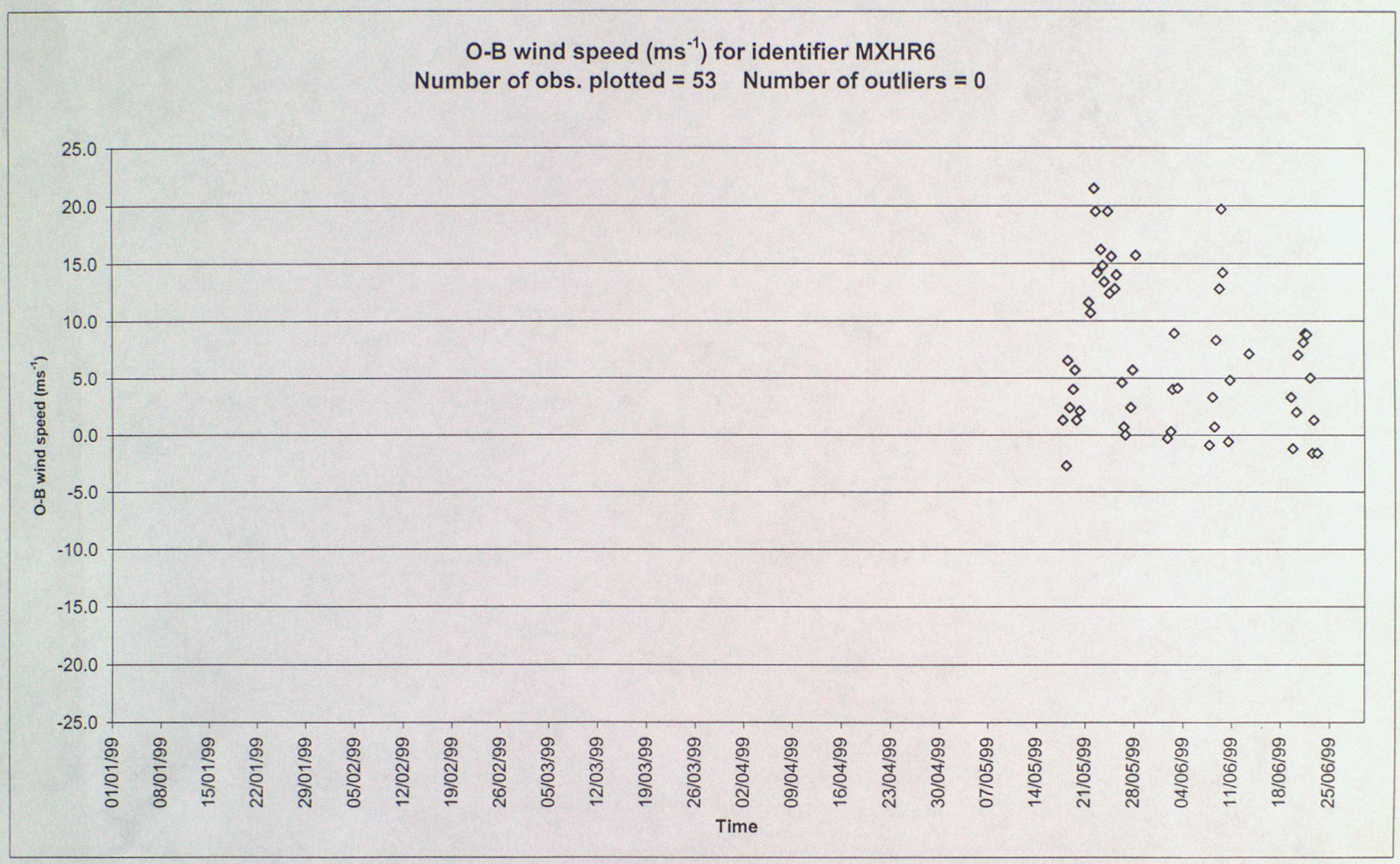

O-B wind speed (ms-1) for identifier ELVG7
Number of obs. plotted = 64 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

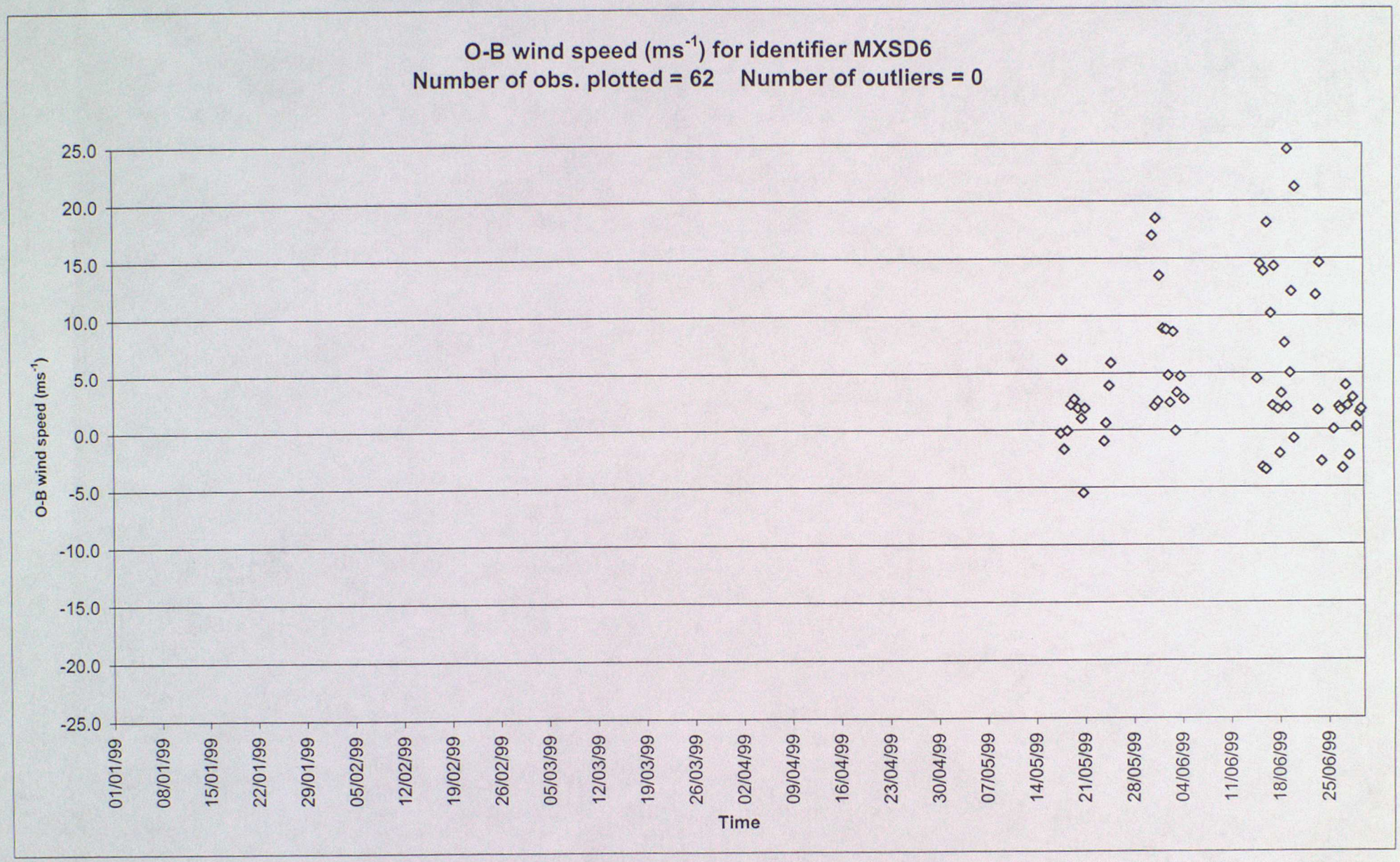

O-B wind speed (ms-1) for identifier ELWC6
Number of obs. plotted = 104 Number of outliers = 14
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

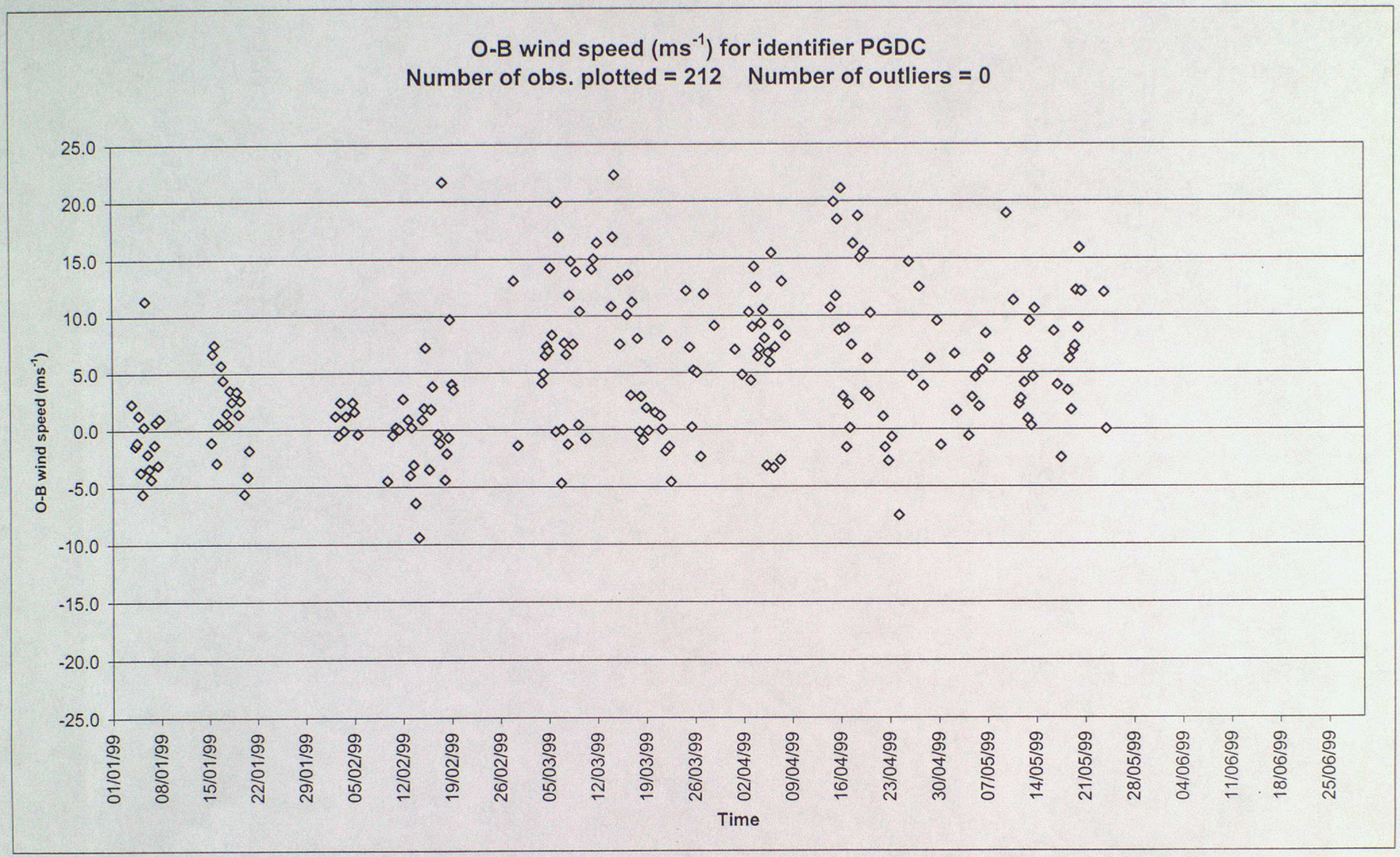

O-B wind speed (ms-1) for identifier EQUV
Number of obs. plotted = 43 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

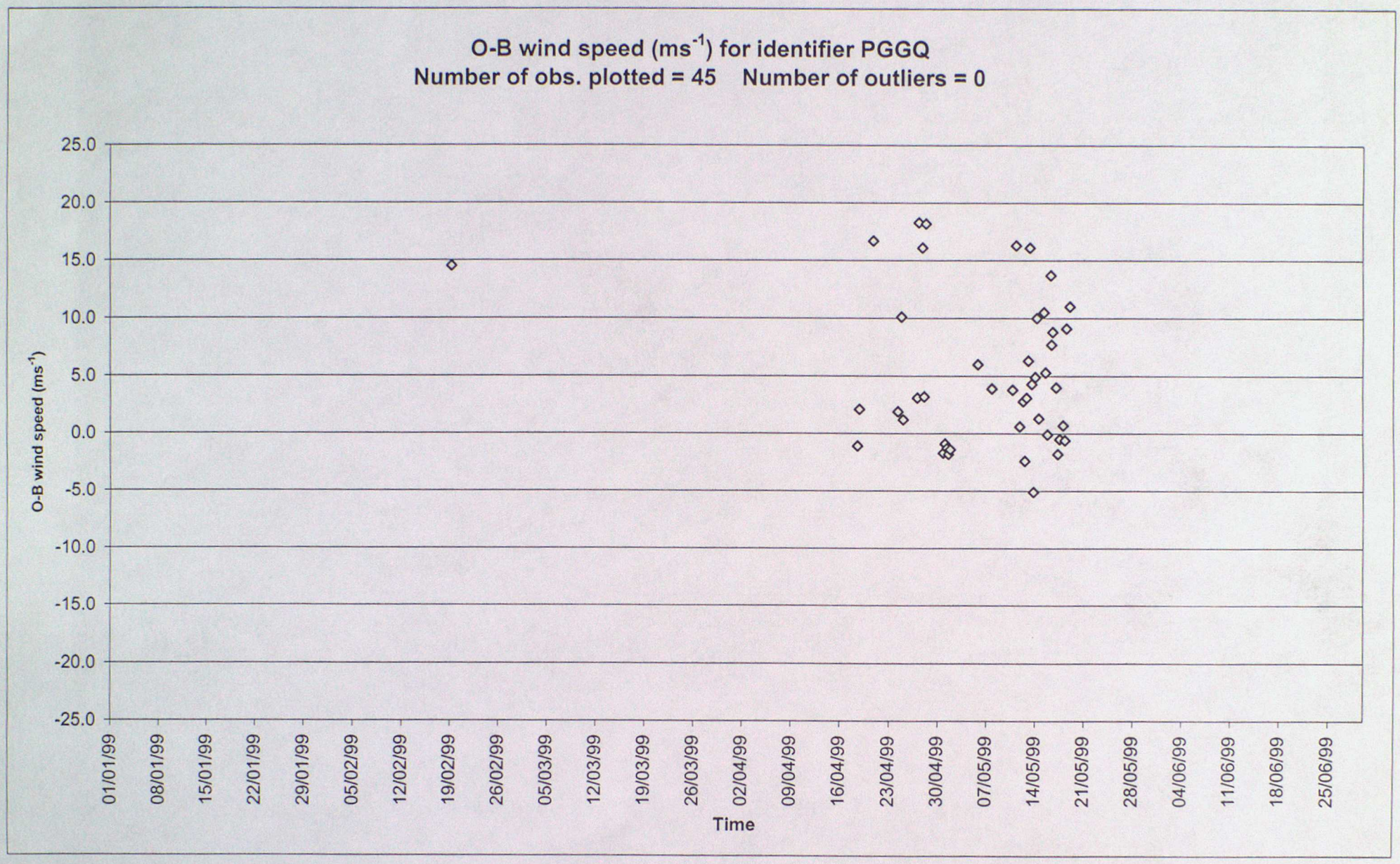

O-B wind speed (ms-1) for identifier LAWO2
Number of obs. plotted = 111 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

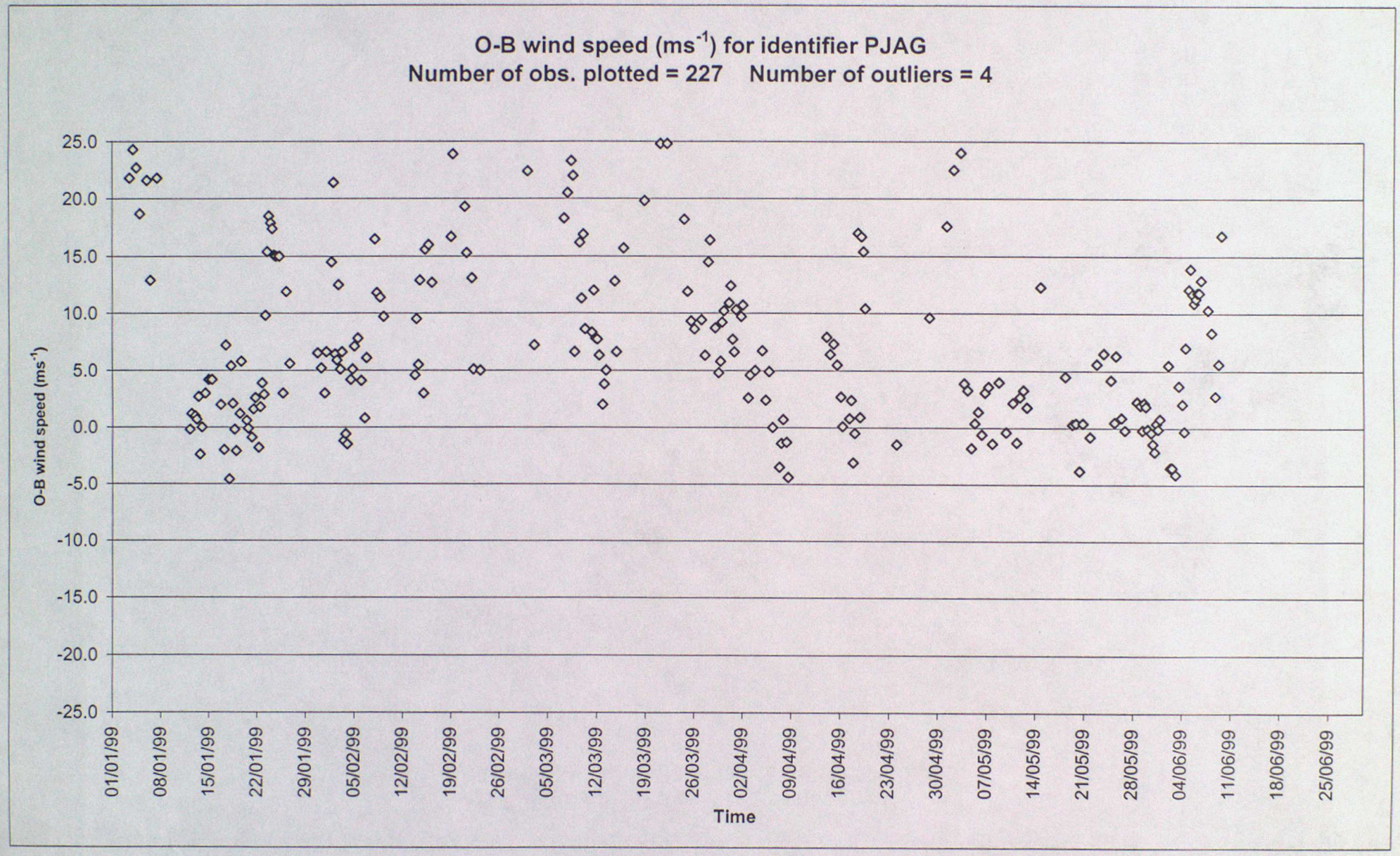

O-B wind speed (ms-1) for identifier MWBJ9
Number of obs. plotted = 116 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

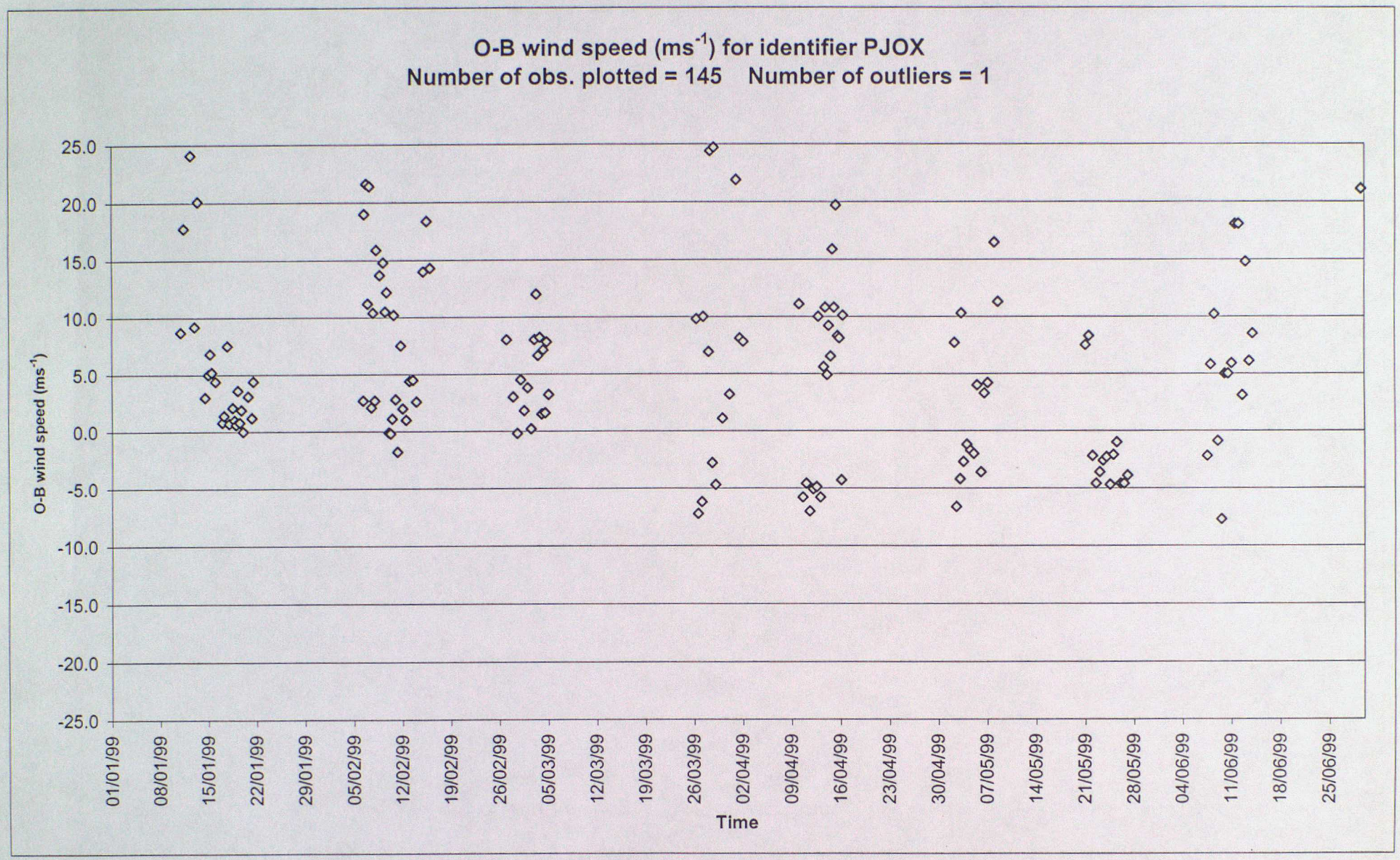

O-B wind speed (ms-1) for identifier MXHR6
Number of obs. plotted = 53 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

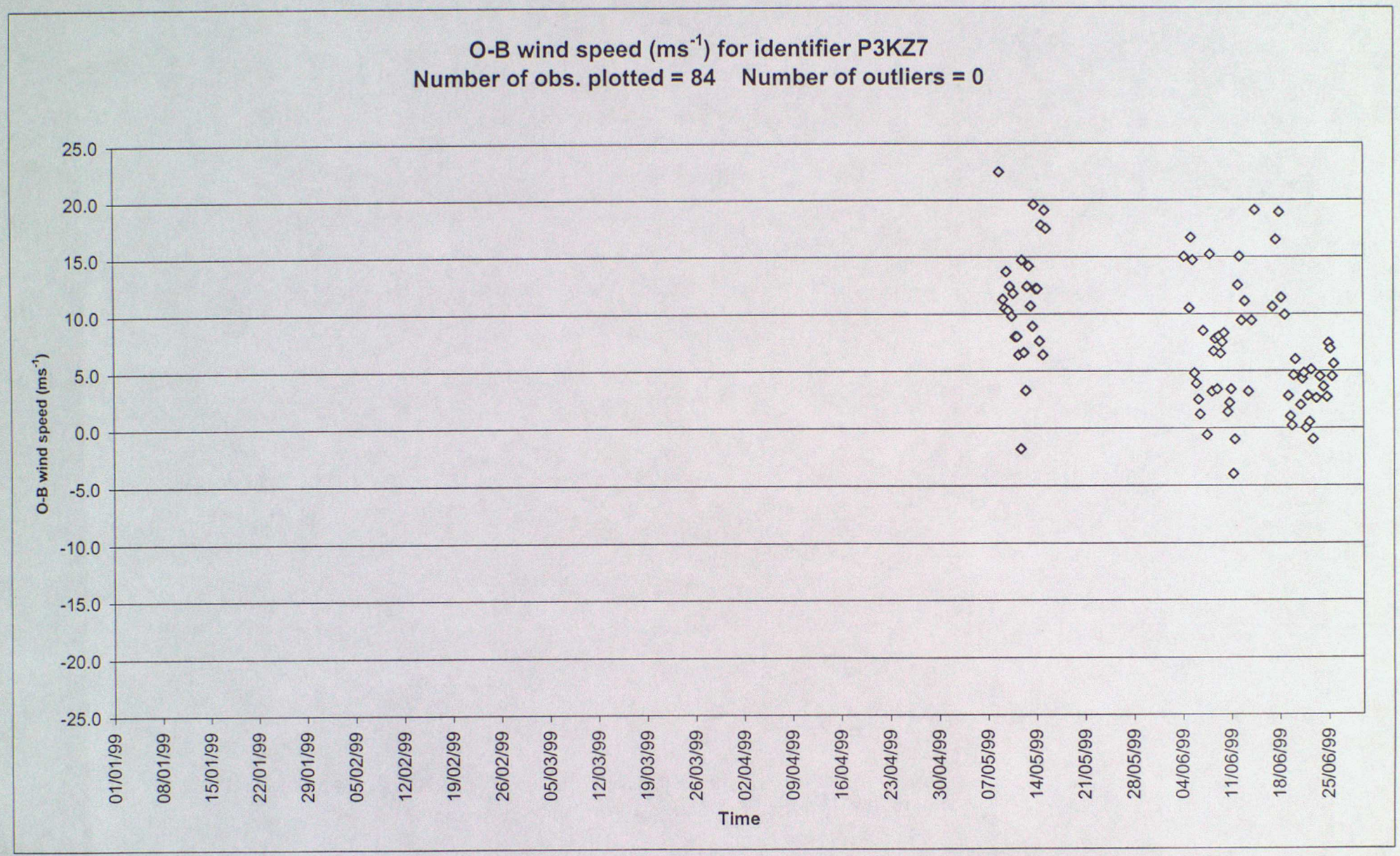

O-B wind speed (ms-1) for identifier MXSD6
Number of obs. plotted = 62 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

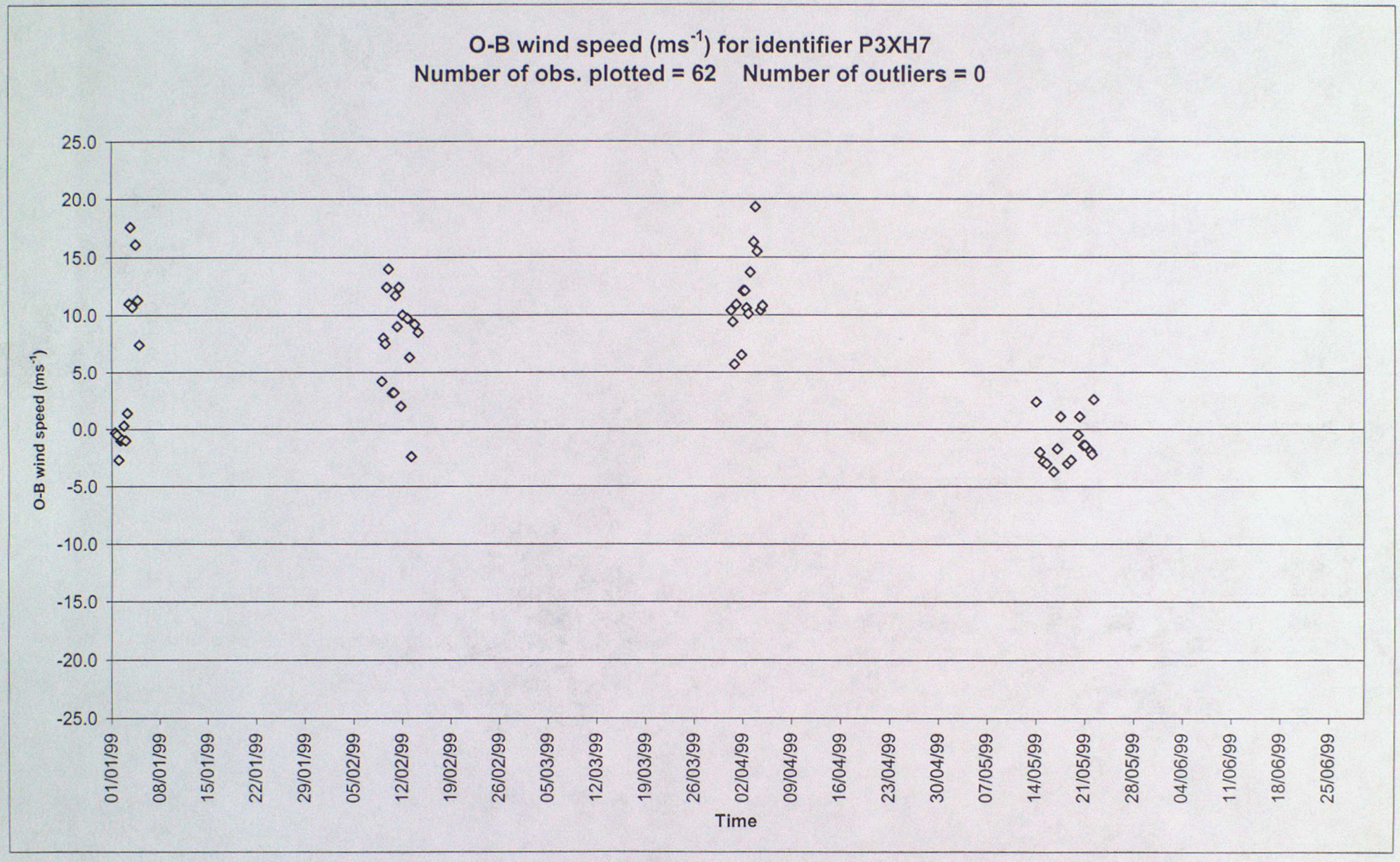

O-B wind speed (ms-1) for identifier PGDC
Number of obs. plotted = 212 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

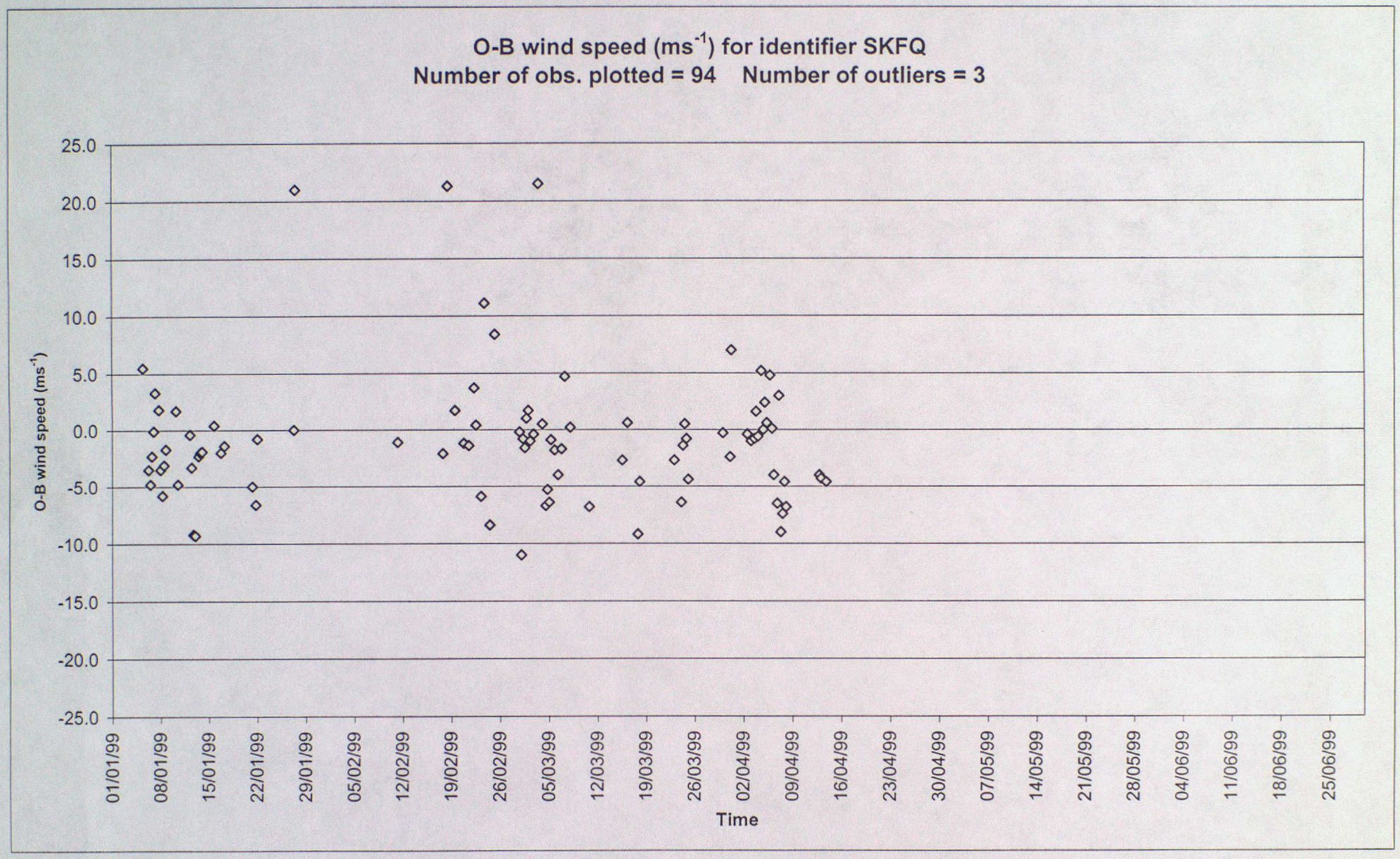

O-B wind speed (ms-1) for identifier PGGQ
Number of obs. plotted = 45 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

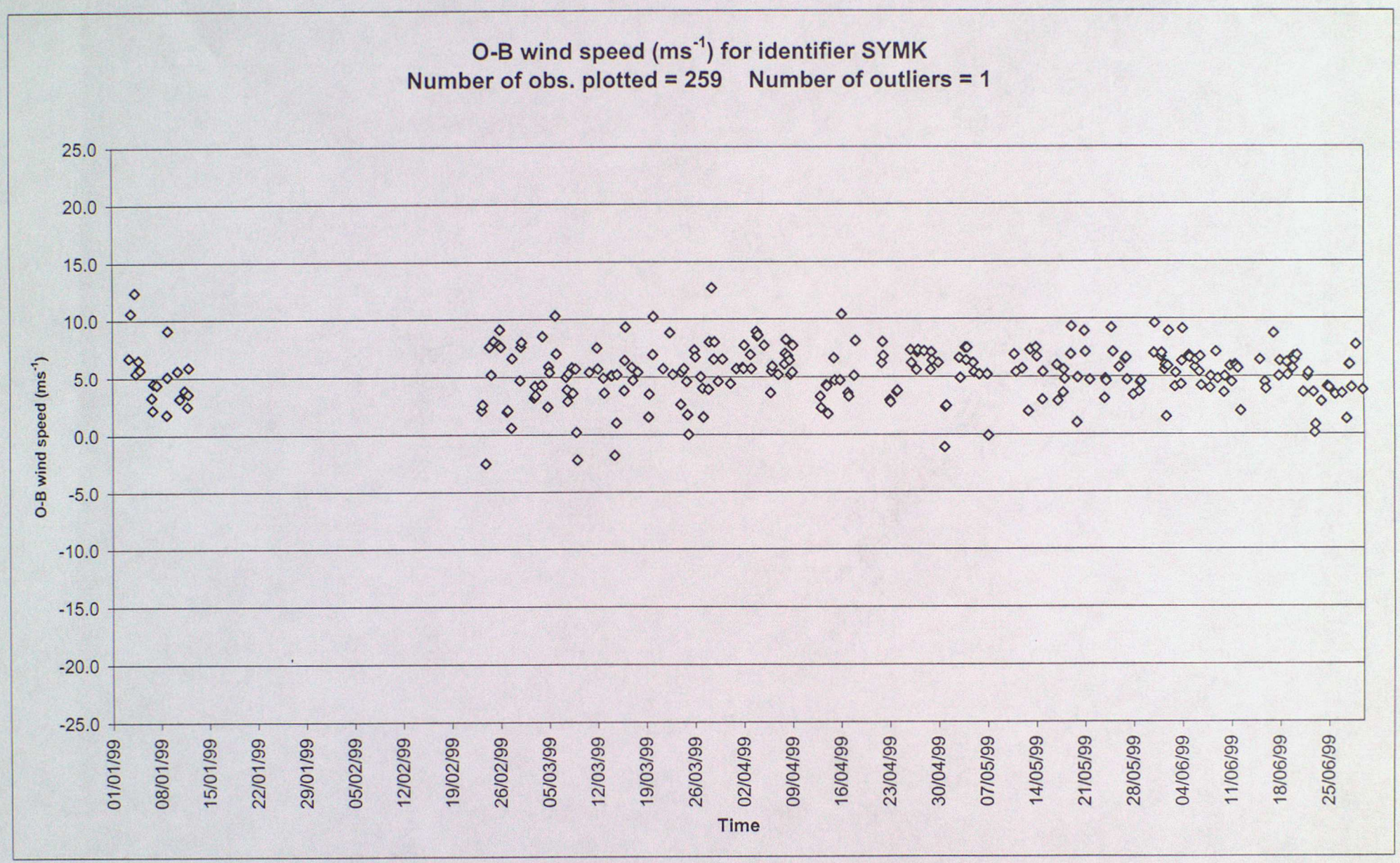

O-B wind speed (ms-1) for identifier PJAG
Number of obs. plotted = 227 Number of outliers = 4
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

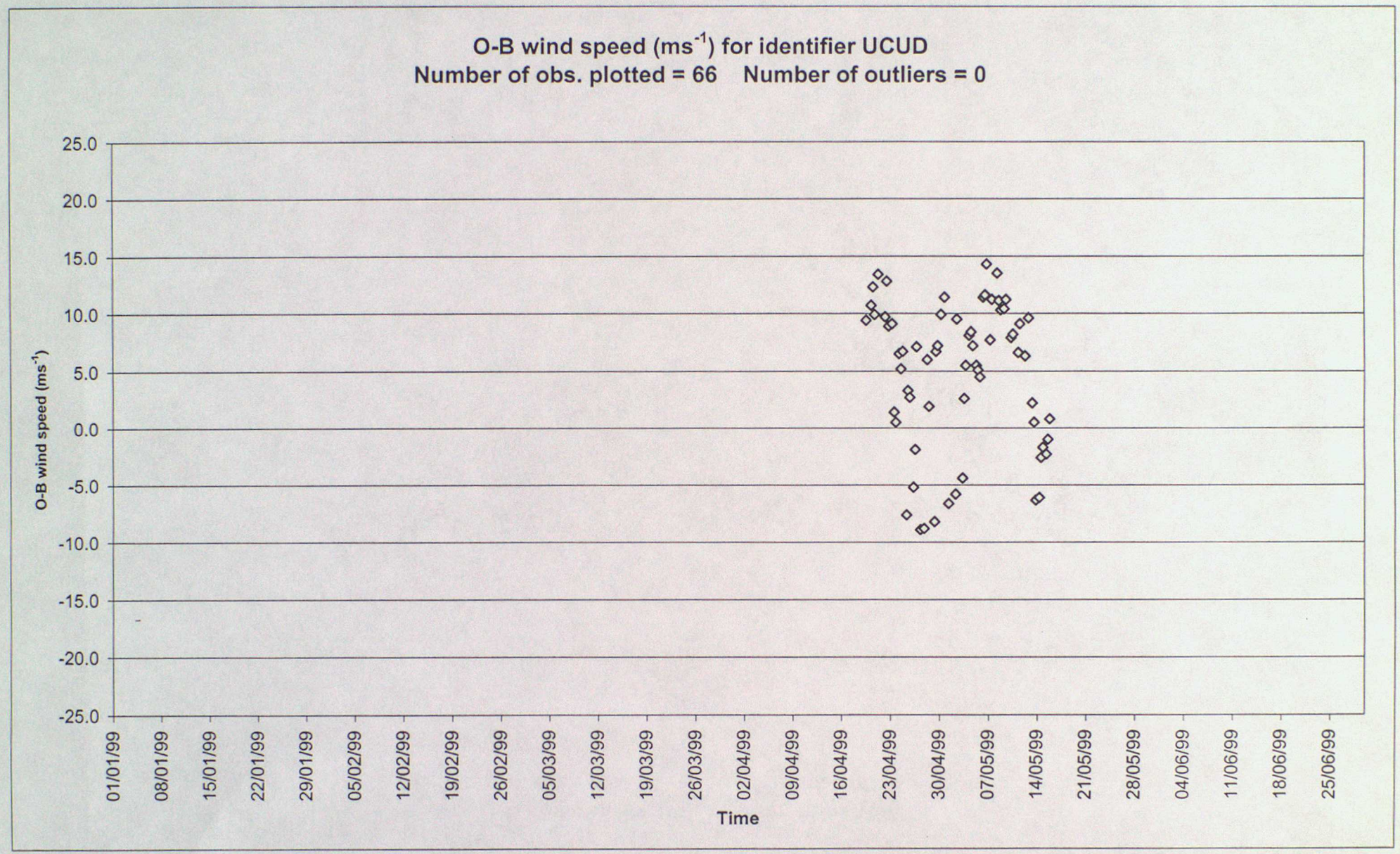

O-B wind speed (ms-1) for identifier PJOX
Number of obs. plotted = 145 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

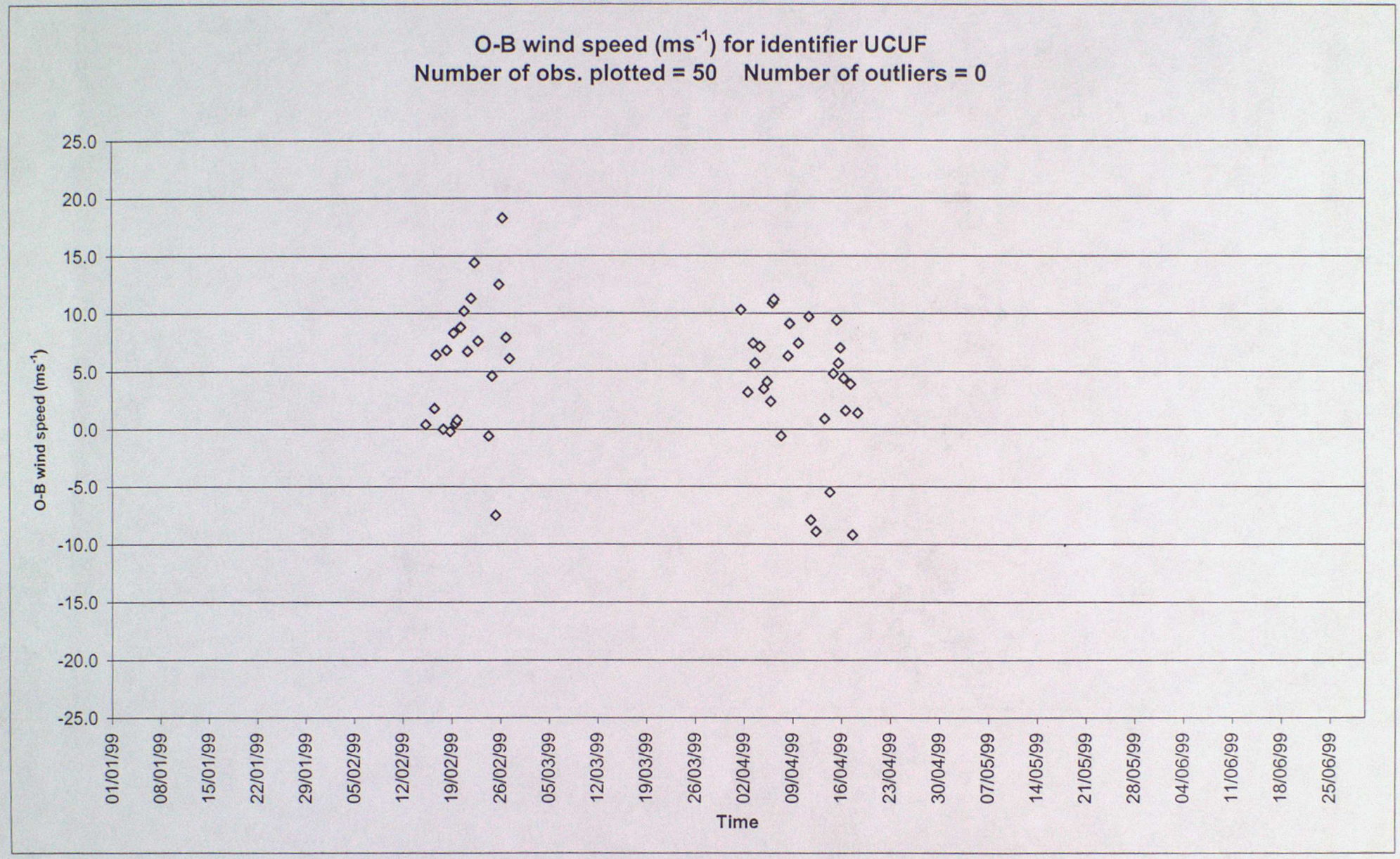

O-B wind speed (ms-1) for identifier P3KZ7
Number of obs. plotted = 84 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

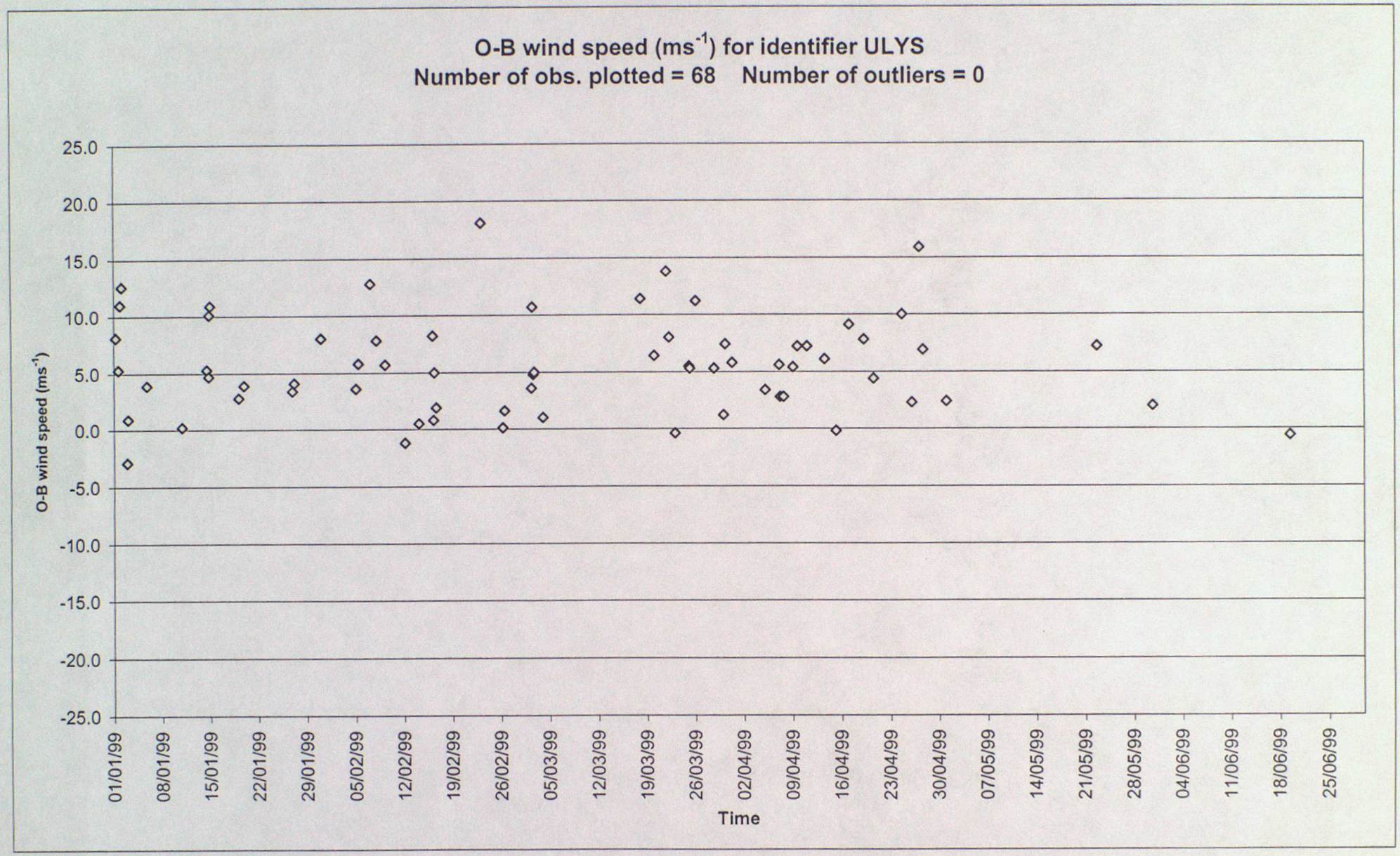

O-B wind speed (ms-1) for identifier P3XH7
Number of obs. plotted = 62 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

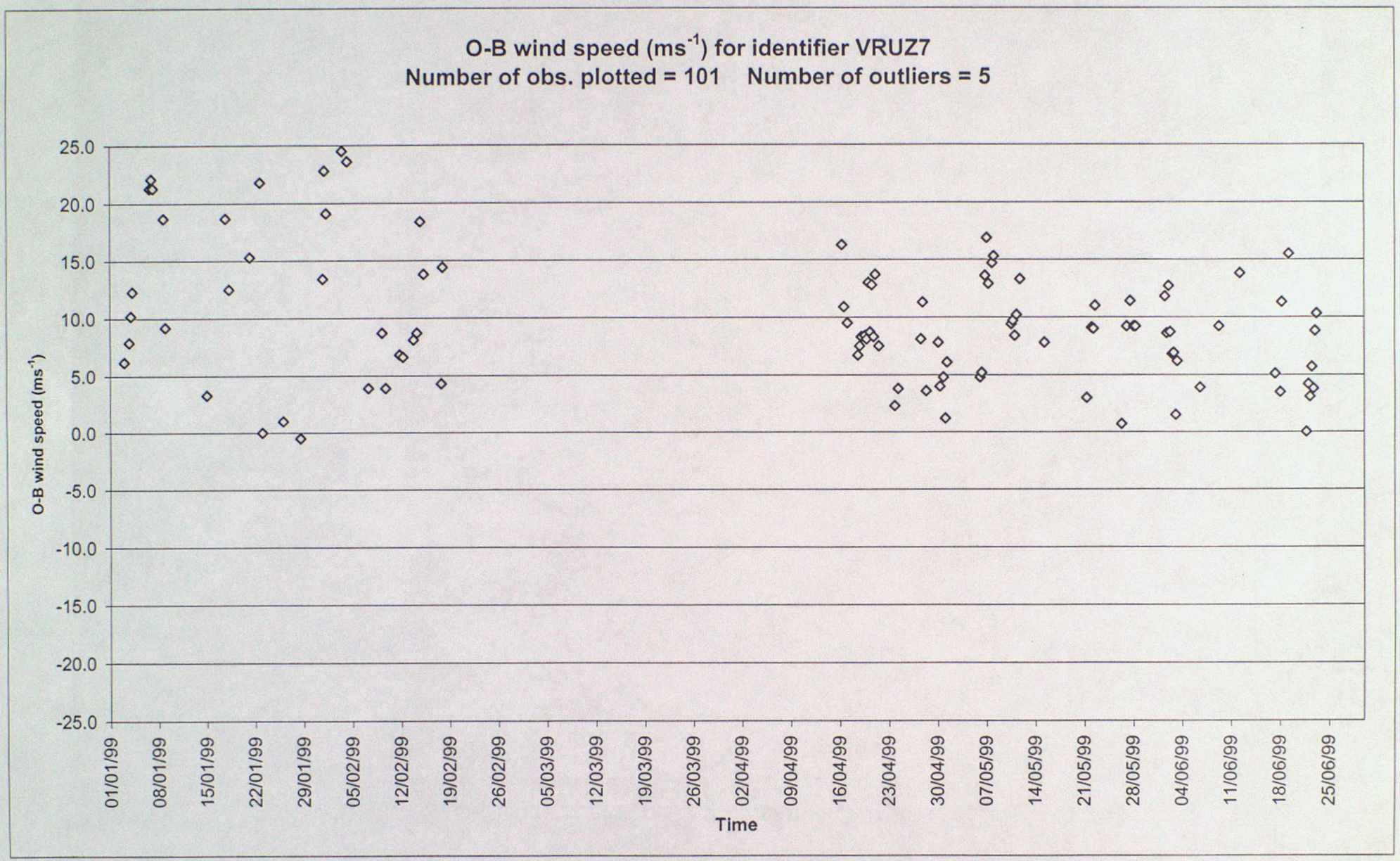

O-B wind speed (ms-1) for identifier SKFQ
Number of obs. plotted = 94 Number of outliers = 3
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

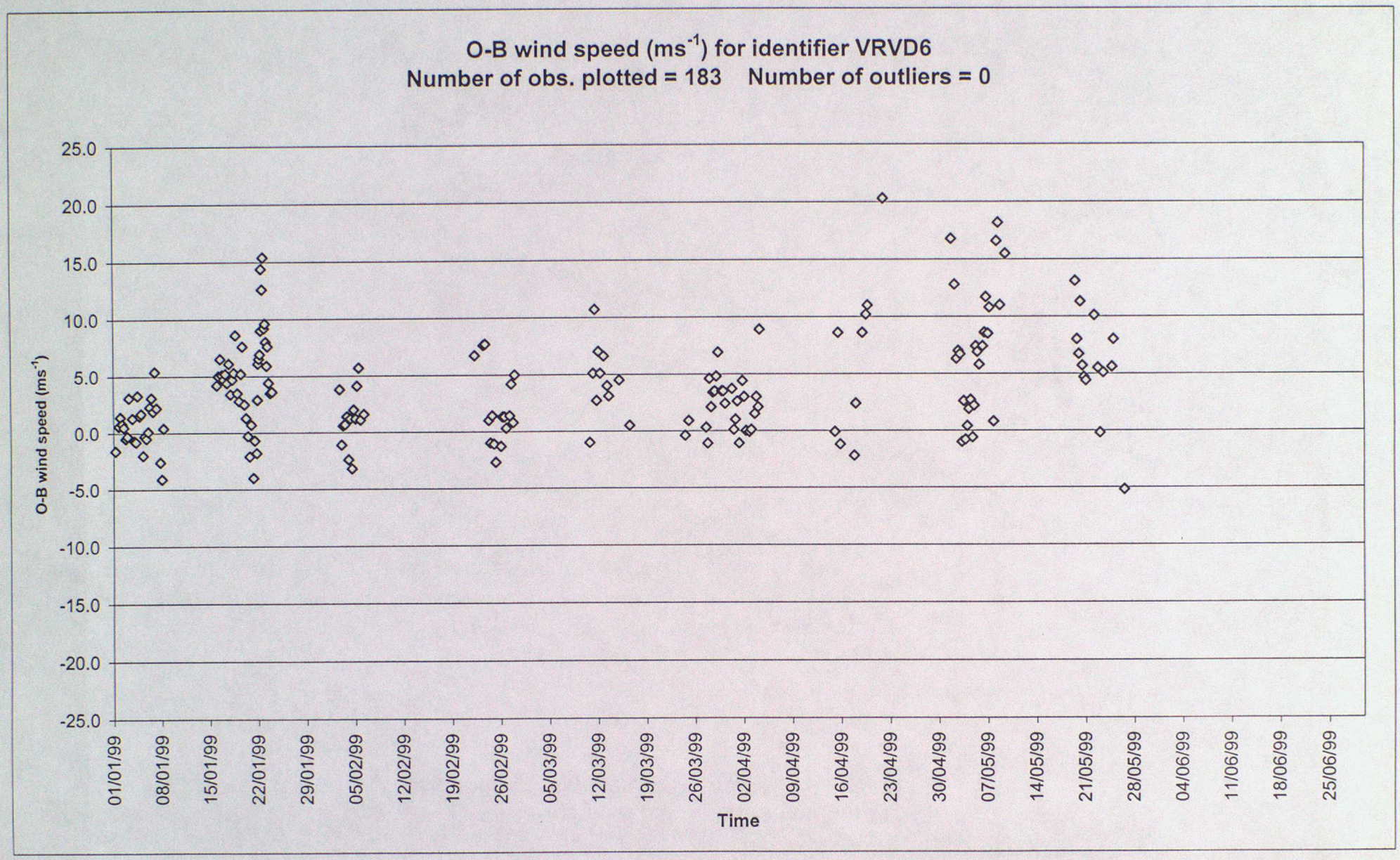

O-B wind speed (ms-1) for identifier SYMK
Number of obs. plotted = 259 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

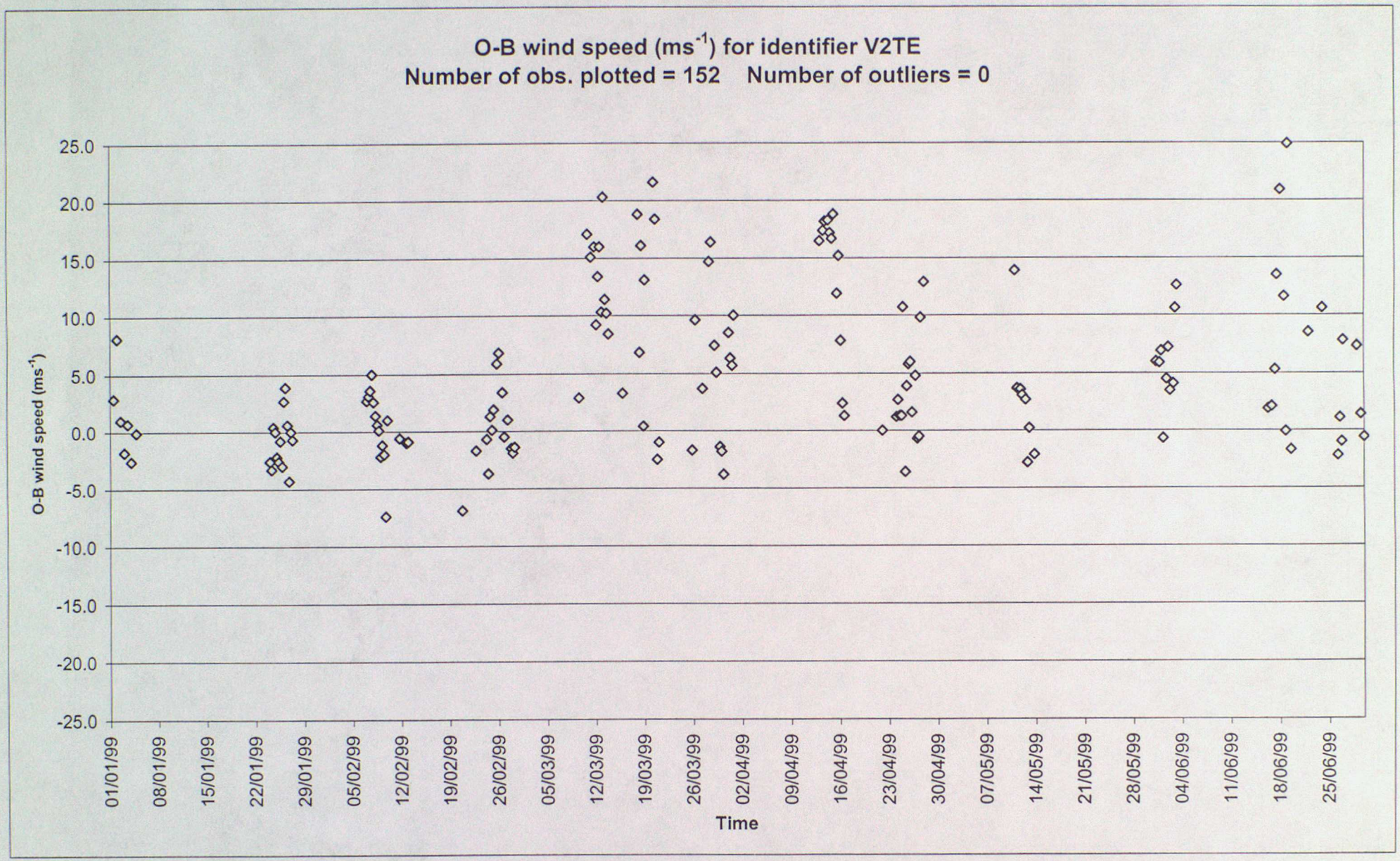

O-B wind speed (ms-1) for identifier UCUD
Number of obs. plotted = 66 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

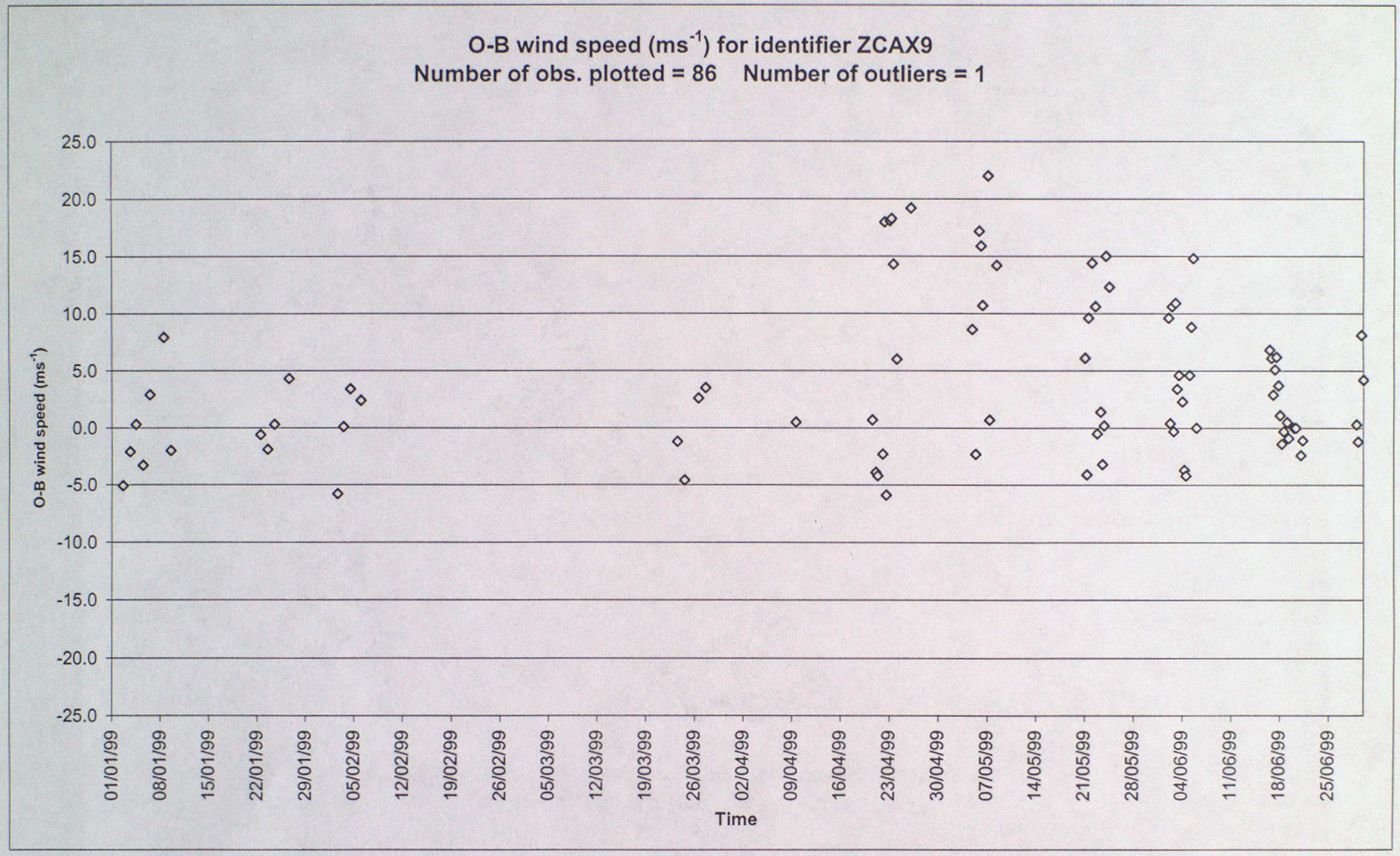

O-B wind speed (ms-1) for identifier UCUF
Number of obs. plotted = 50 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

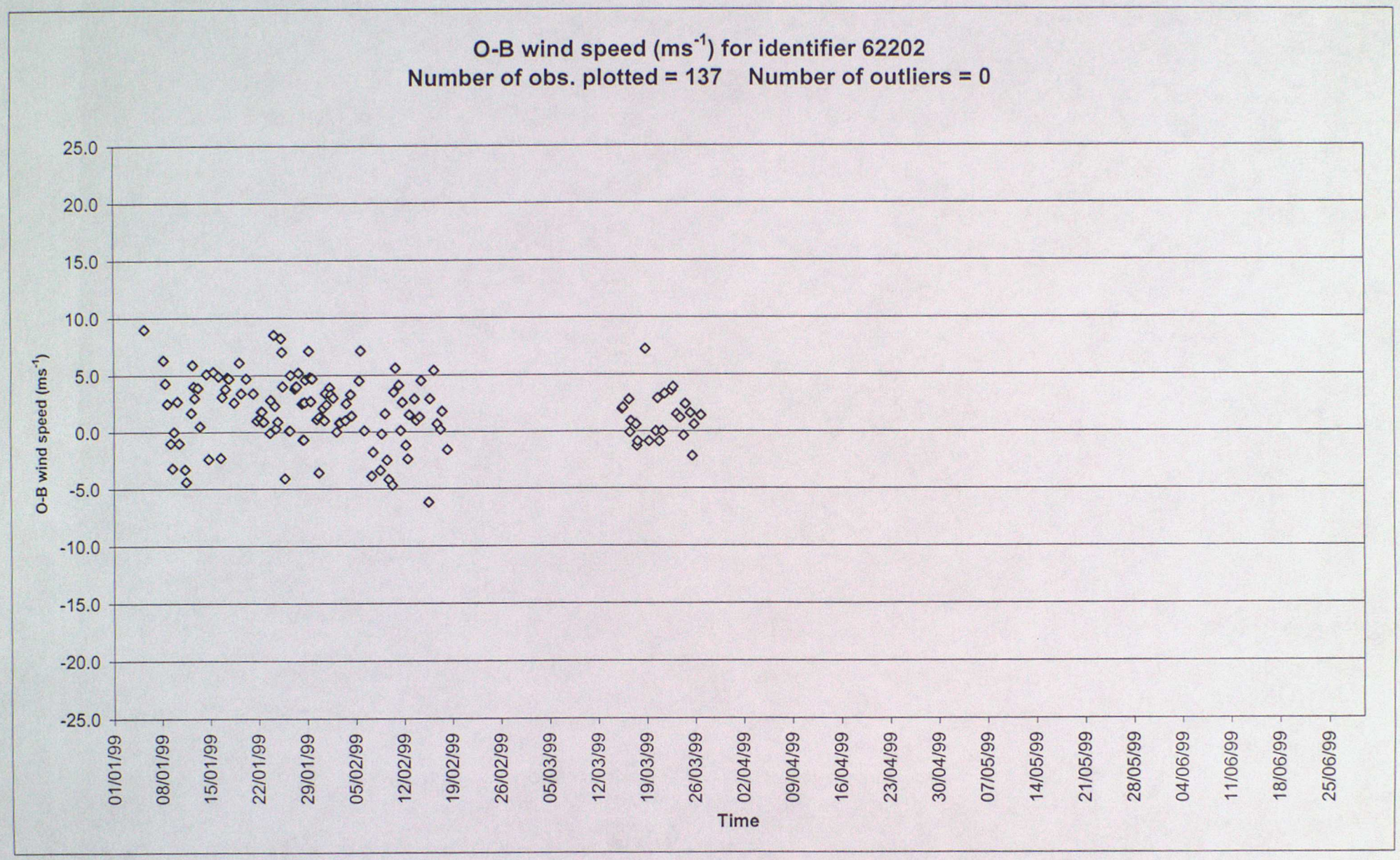

O-B wind speed (ms-1) for identifier ULYS
Number of obs. plotted = 68 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

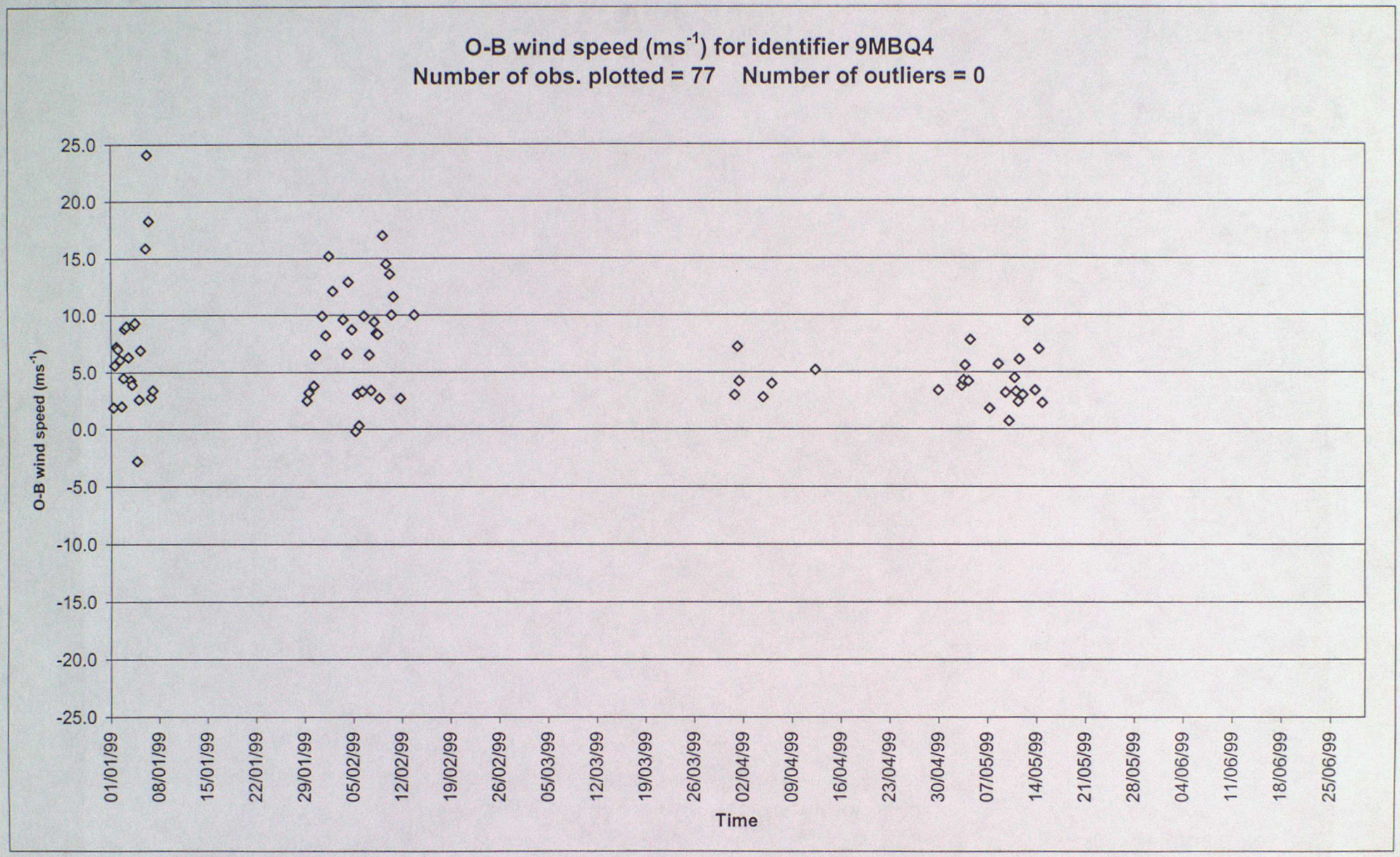

O-B wind speed (ms-1) for identifier VRUZ7
Number of obs. plotted = 101 Number of outliers = 5
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

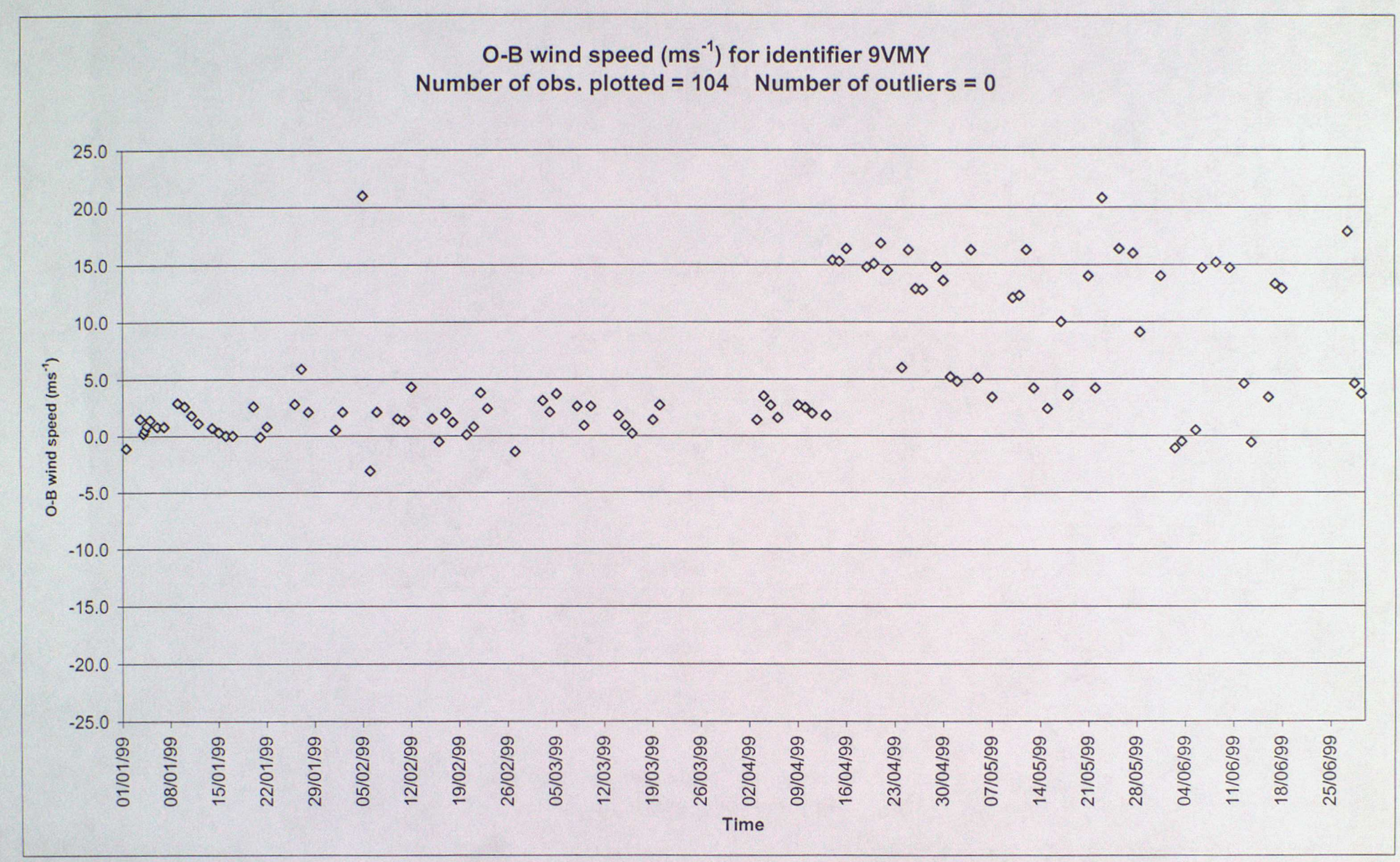

O-B wind speed (ms-1) for identifier VRVD6
Number of obs. plotted = 183 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

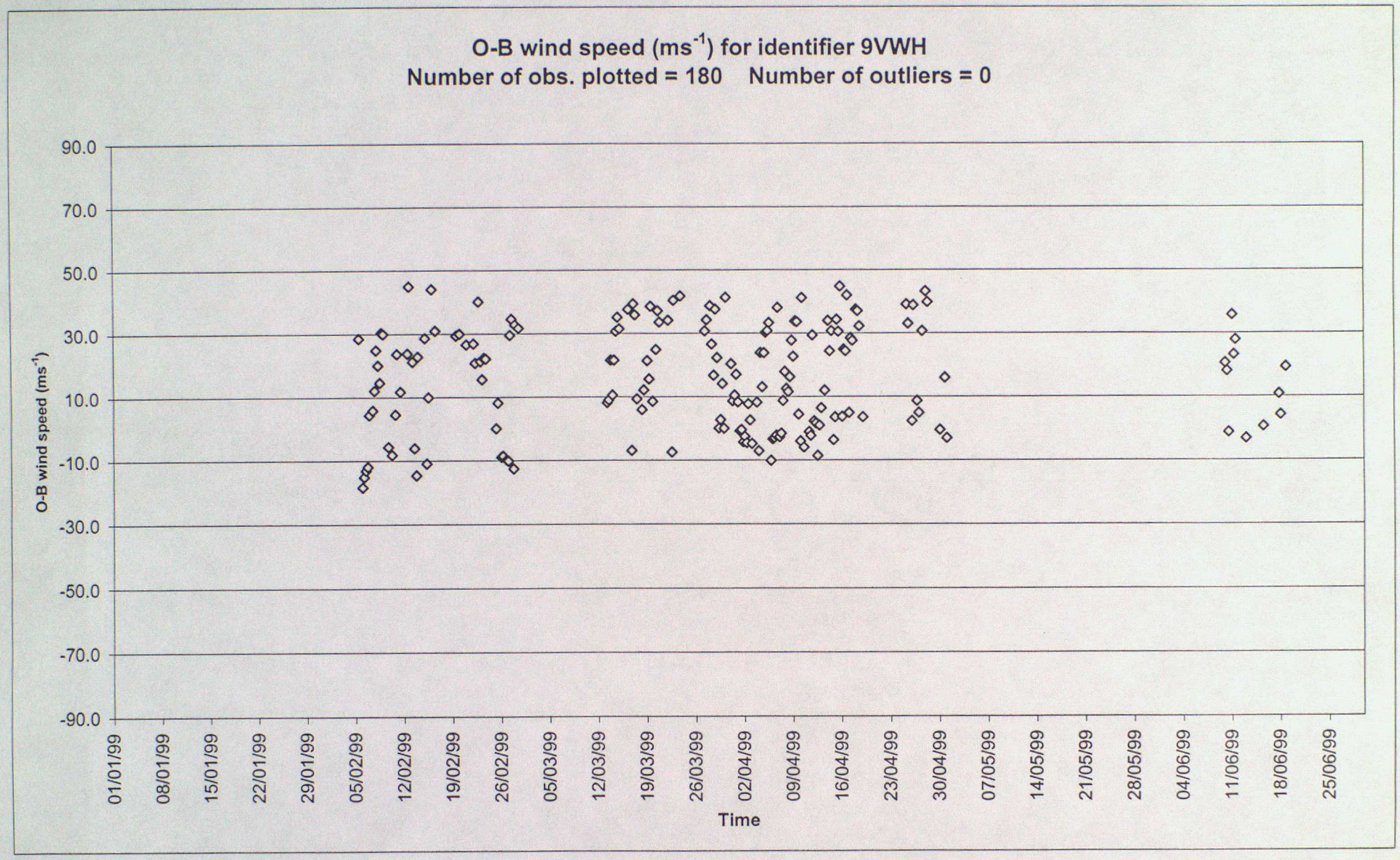

O-B wind speed (ms-1) for identifier V2TE
Number of obs. plotted = 152 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

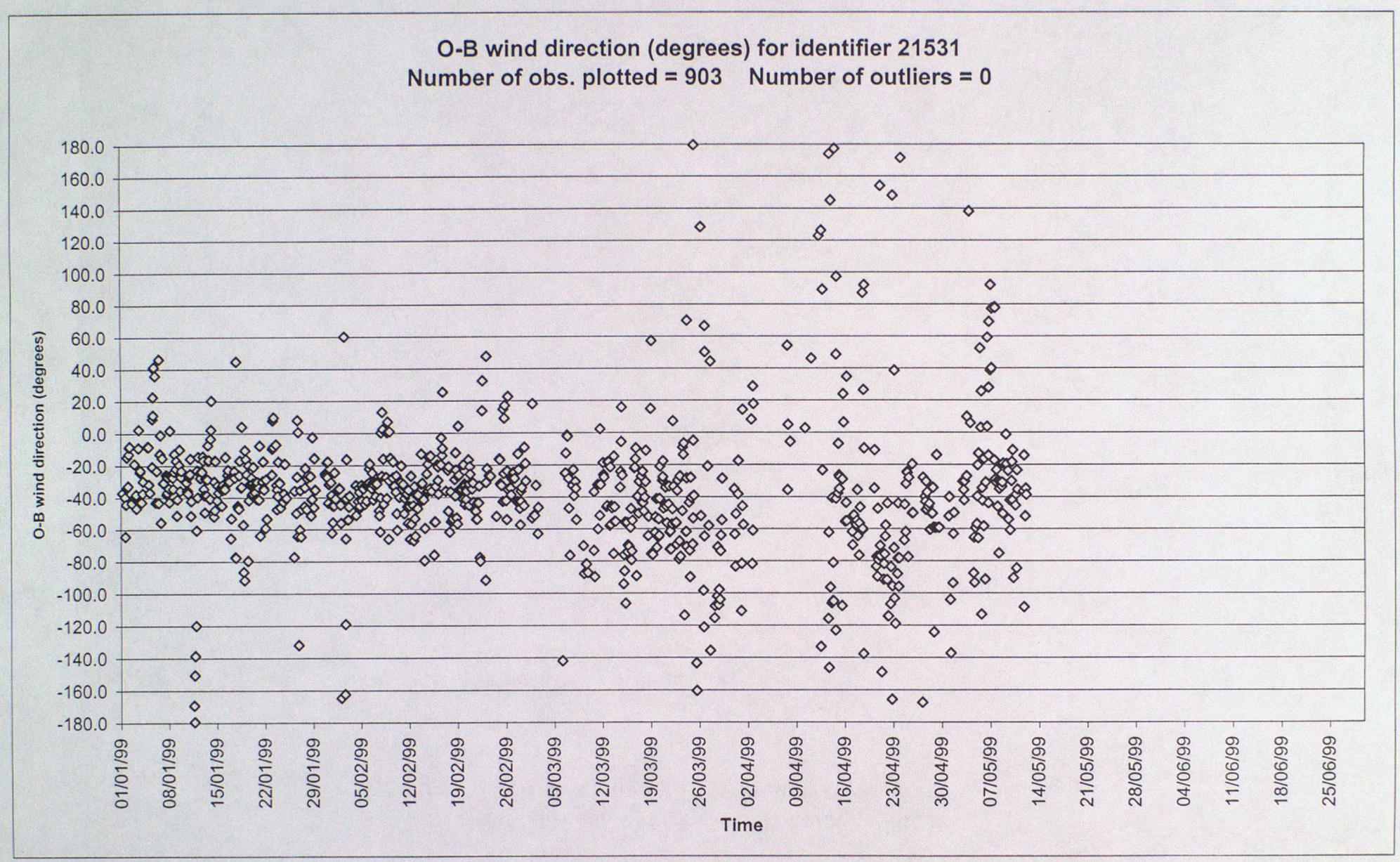

O-B wind speed (ms-1) for identifier ZCAX9
Number of obs. plotted = 86 Number of outliers = 1
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

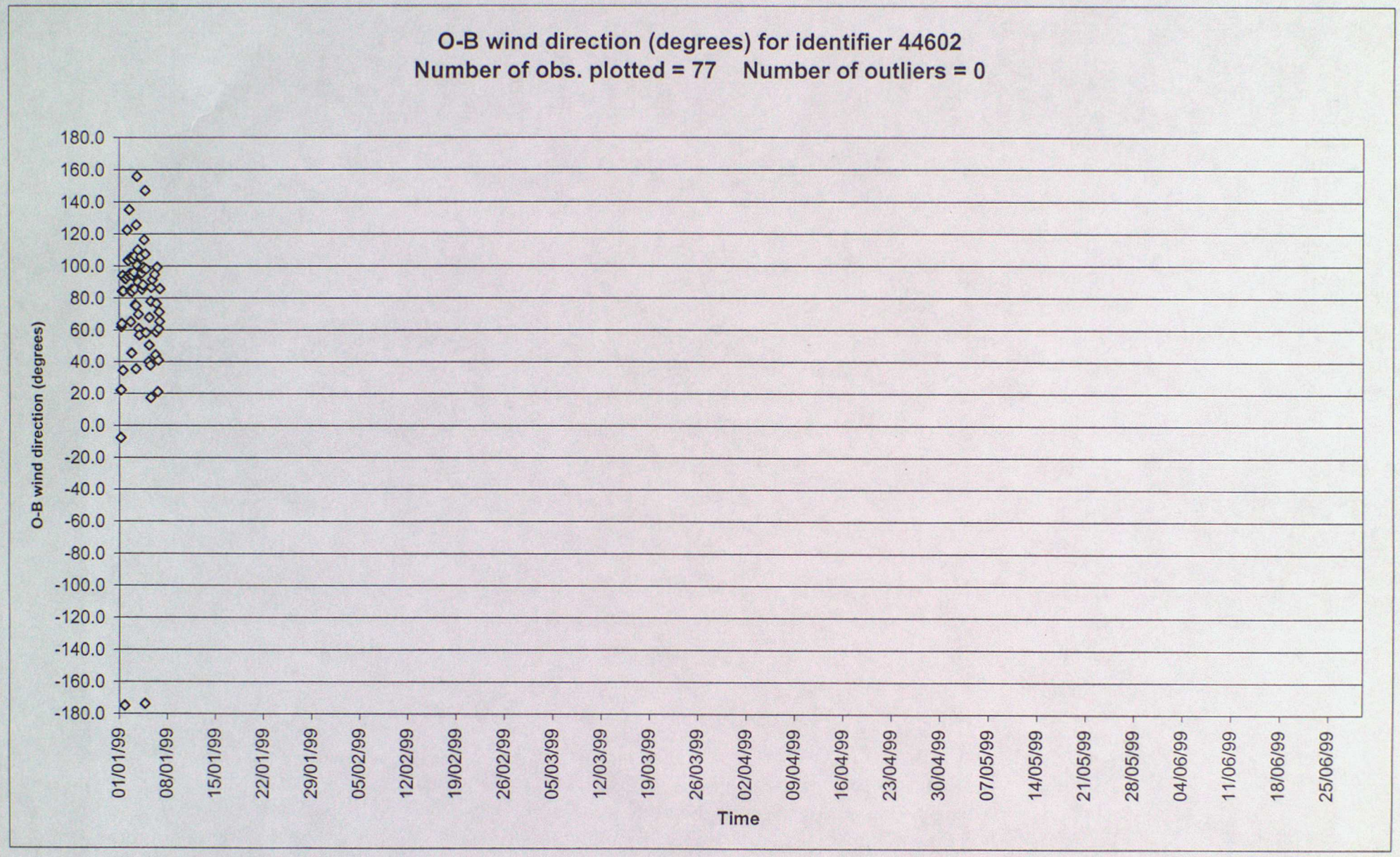

O-B wind speed (ms-1) for identifier 62202
Number of obs. plotted = 137 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

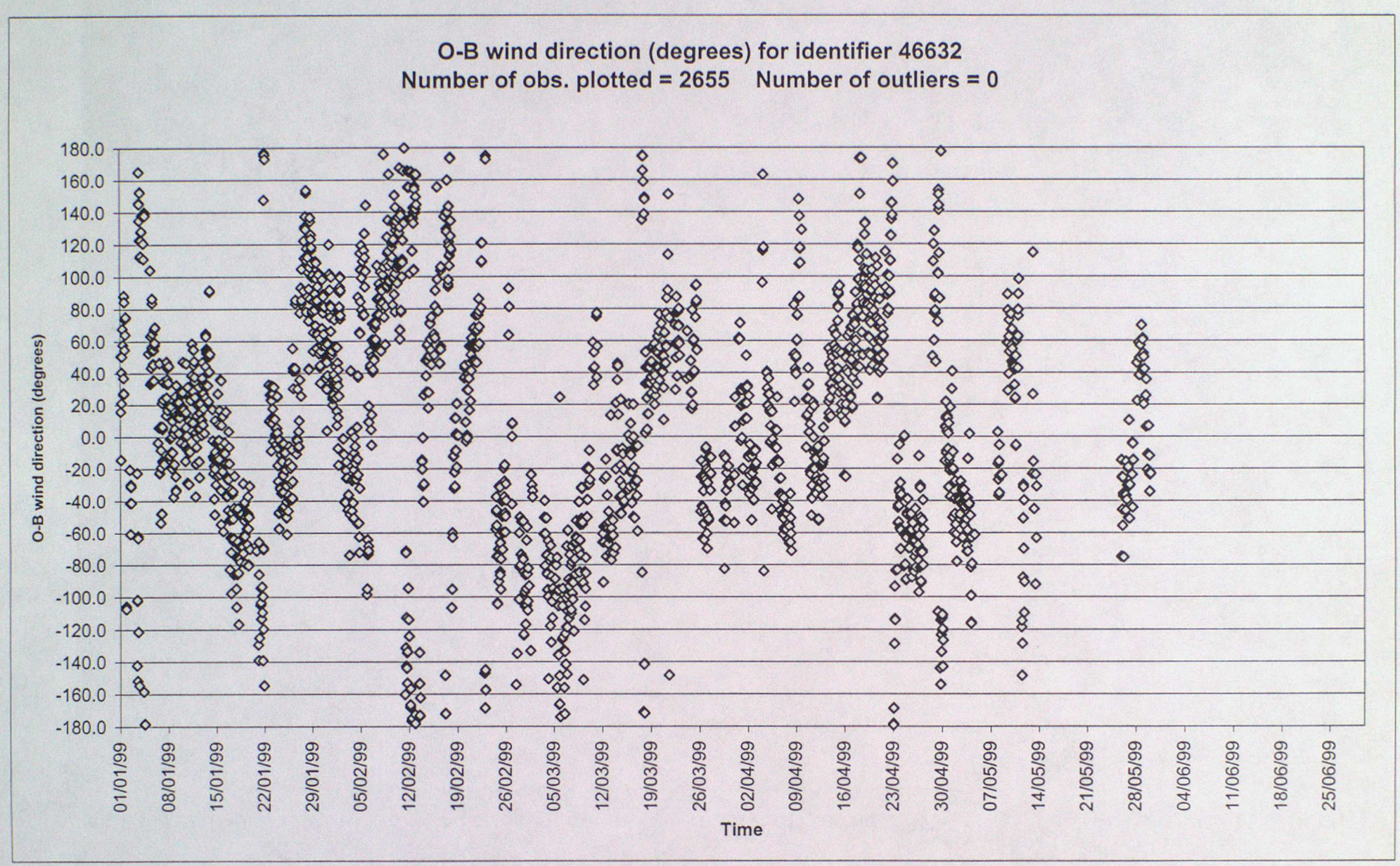

O-B wind speed (ms-1) for identifier 9MBQ4
Number of obs. plotted = 77 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

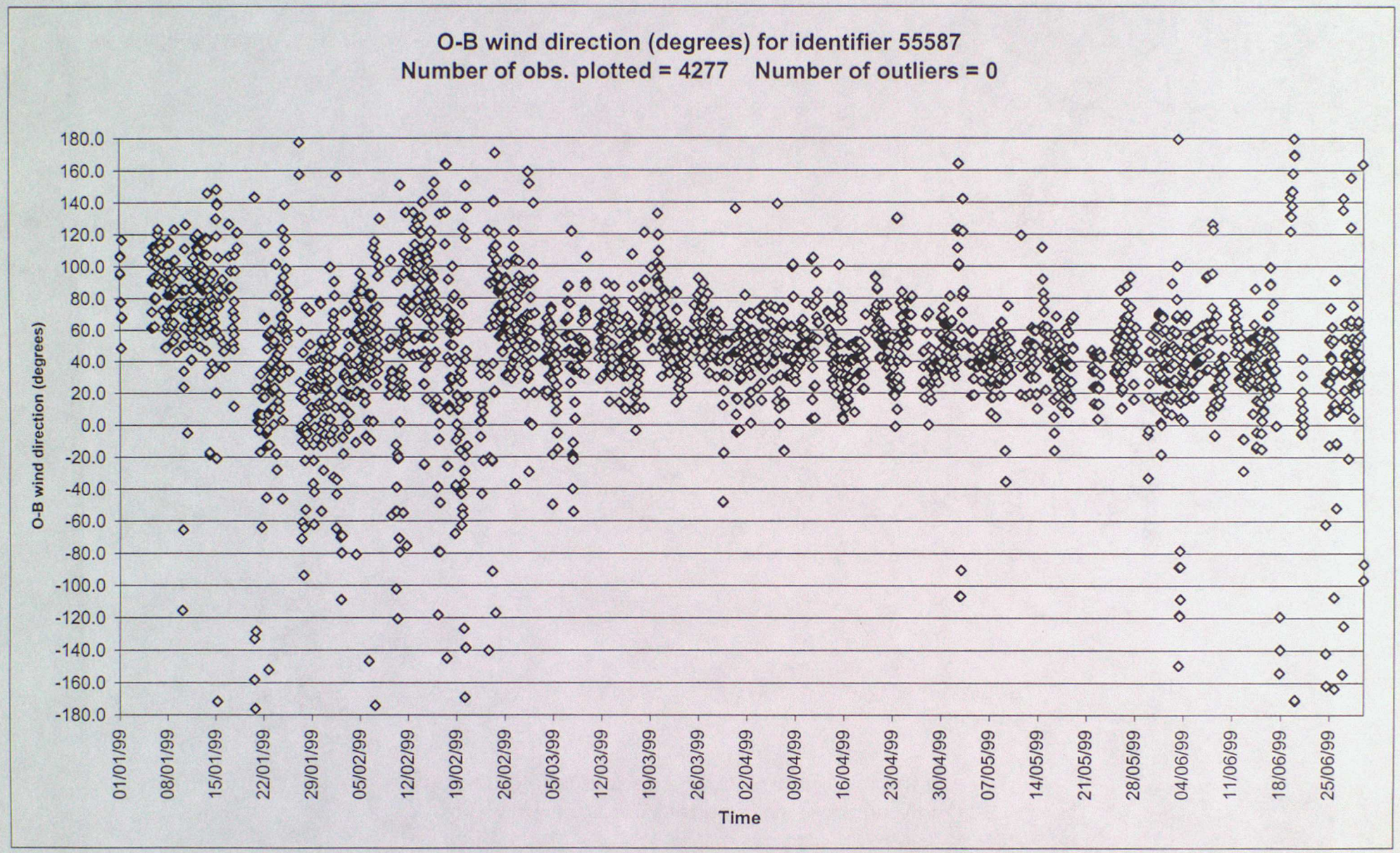

O-B wind speed (ms-1) for identifier 9VMY
Number of obs. plotted = 104 Number of outliers = 0
O-B wind speed (ms-1)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

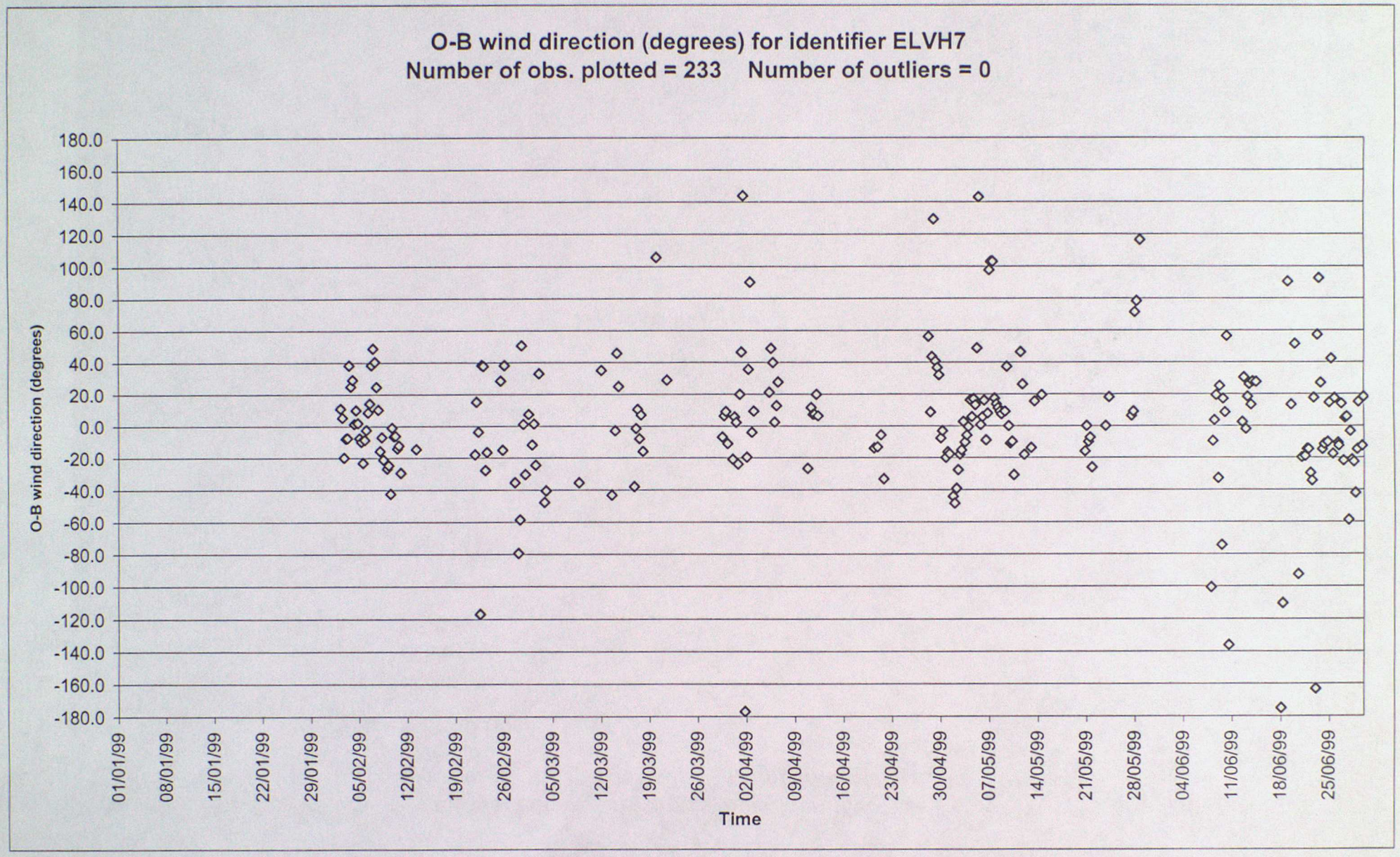

O-B wind speed (ms-1) for identifier 9VWH
Number of obs. plotted = 180 Number of outliers = 0
O-B wind speed (ms-1)
90.0
70.0
50.0
30.0
10.0
-10.0
-30.0
-50.0
-70.0
-90.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

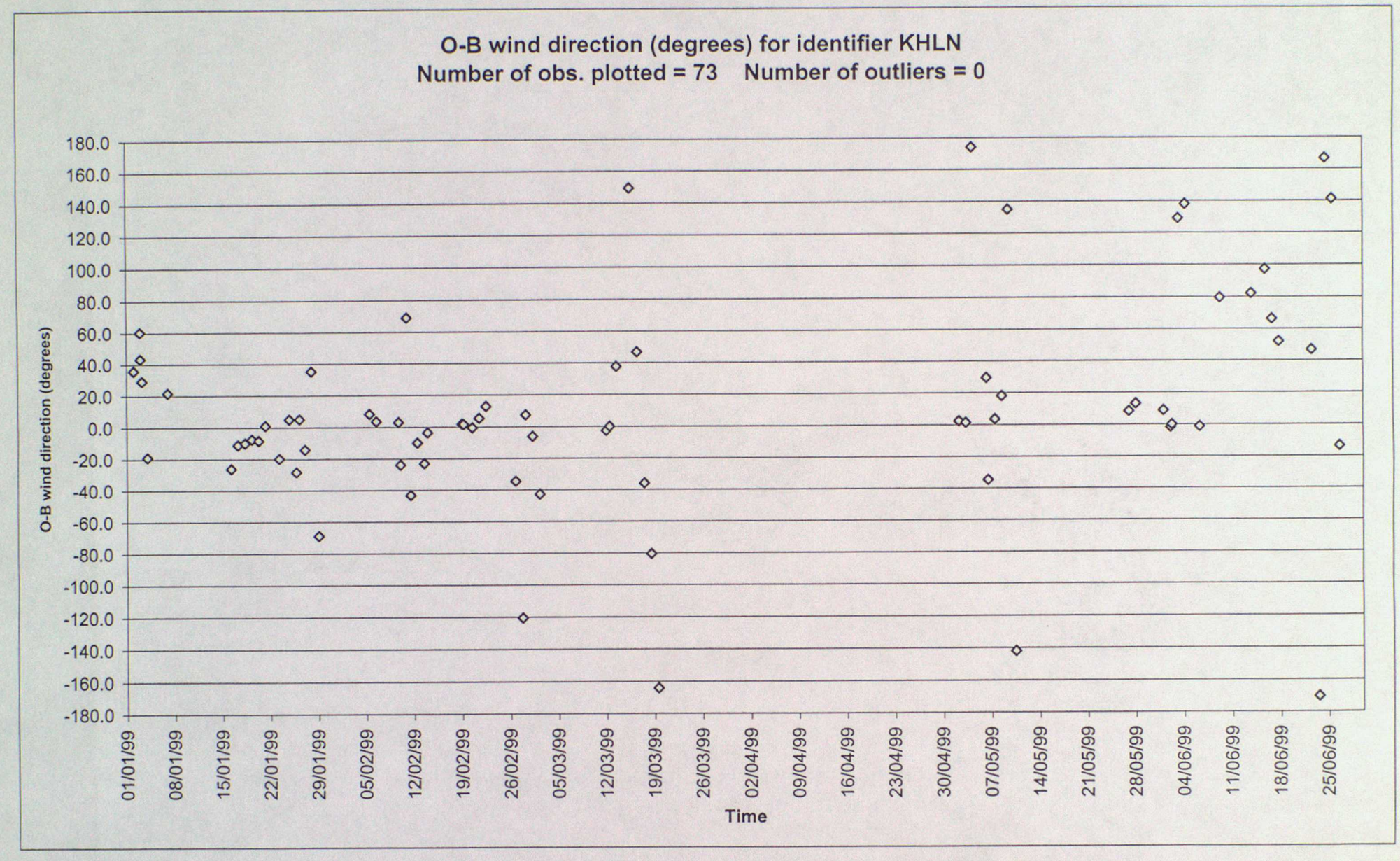

O-B wind direction (degrees) for identifier 21531
Number of obs. plotted = 903 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time

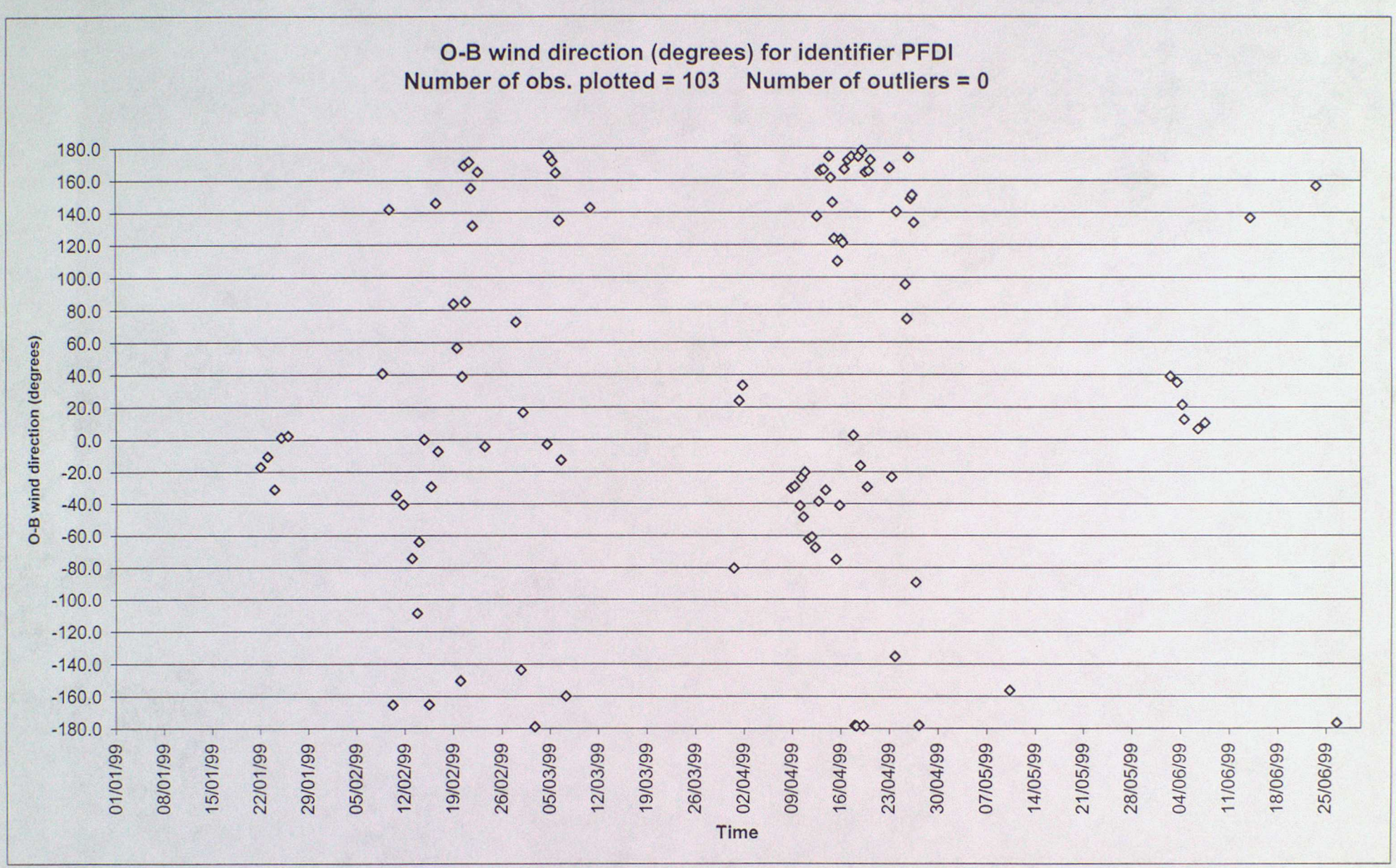

O-B wind direction (degrees) for identifier 44602
Number of obs. plotted = 77 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier 46632
Number of obs. plotted = 2655 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier 55587
Number of obs. plotted = 4277 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier ELVH7
Number of obs. plotted = 233 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier KHLN
Number of obs. plotted = 73 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier PFDI
Number of obs. plotted = 103 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
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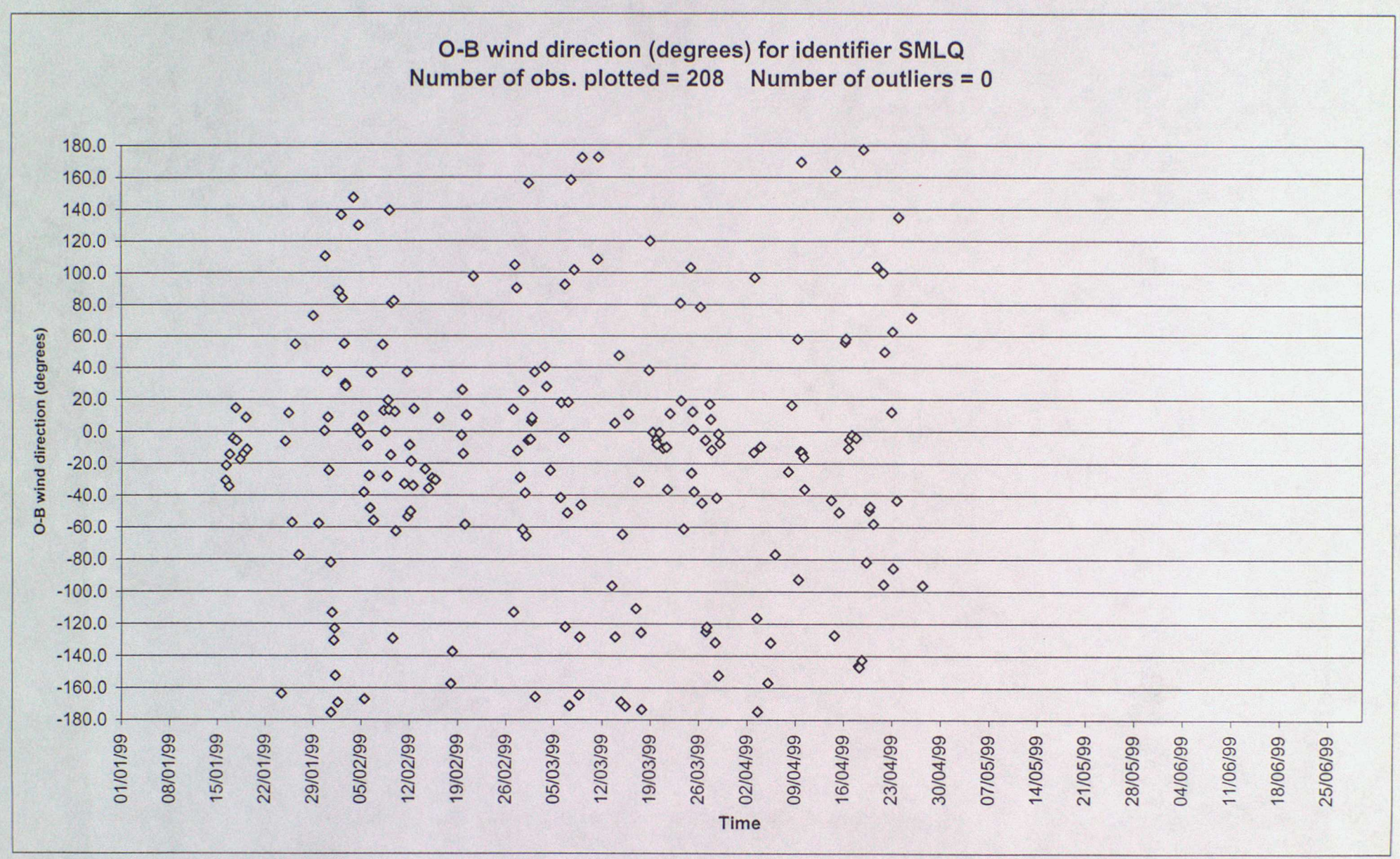
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier SMLQ
Number of obs. plotted = 208 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
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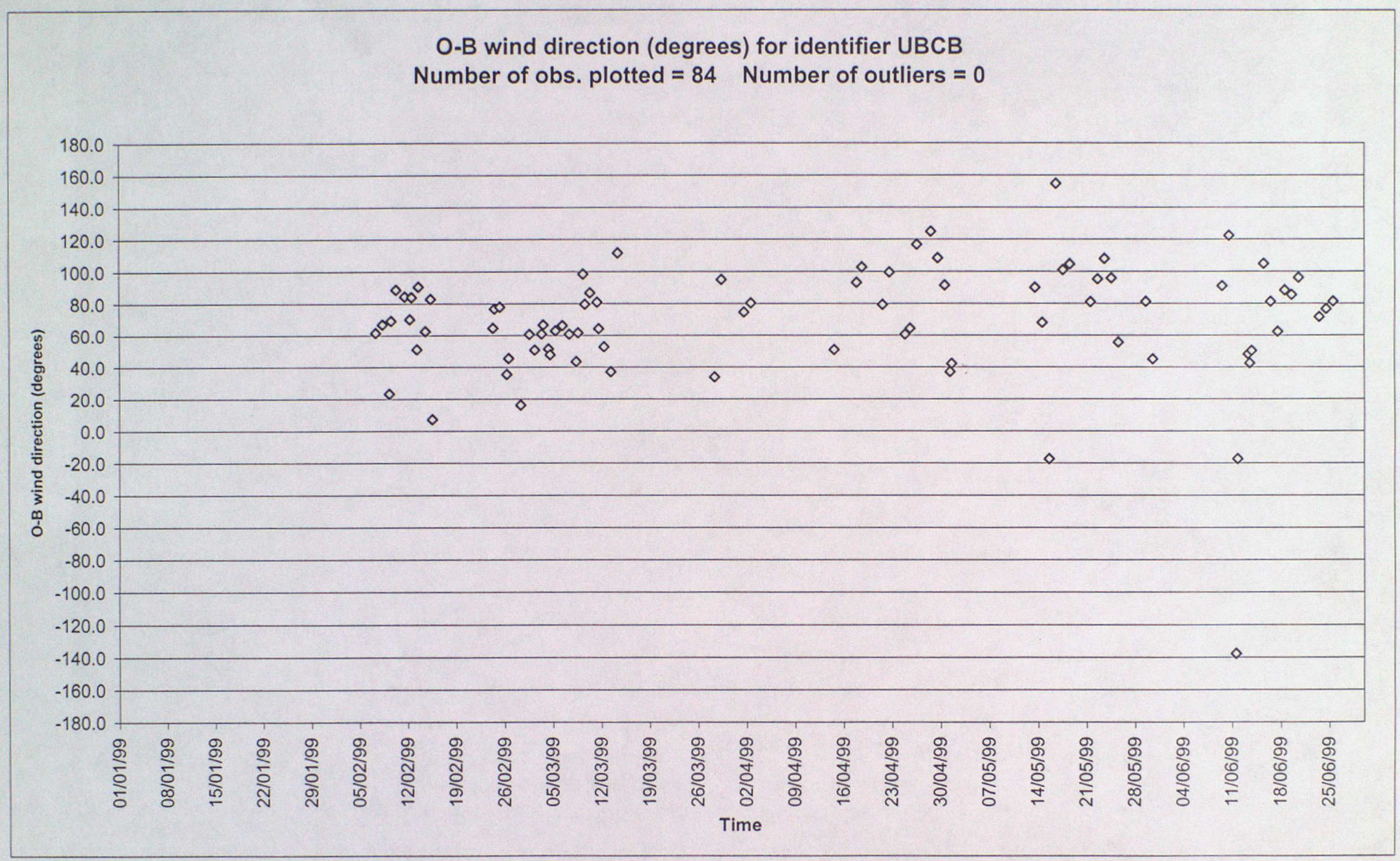
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier UBCB
Number of obs. plotted = 84 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
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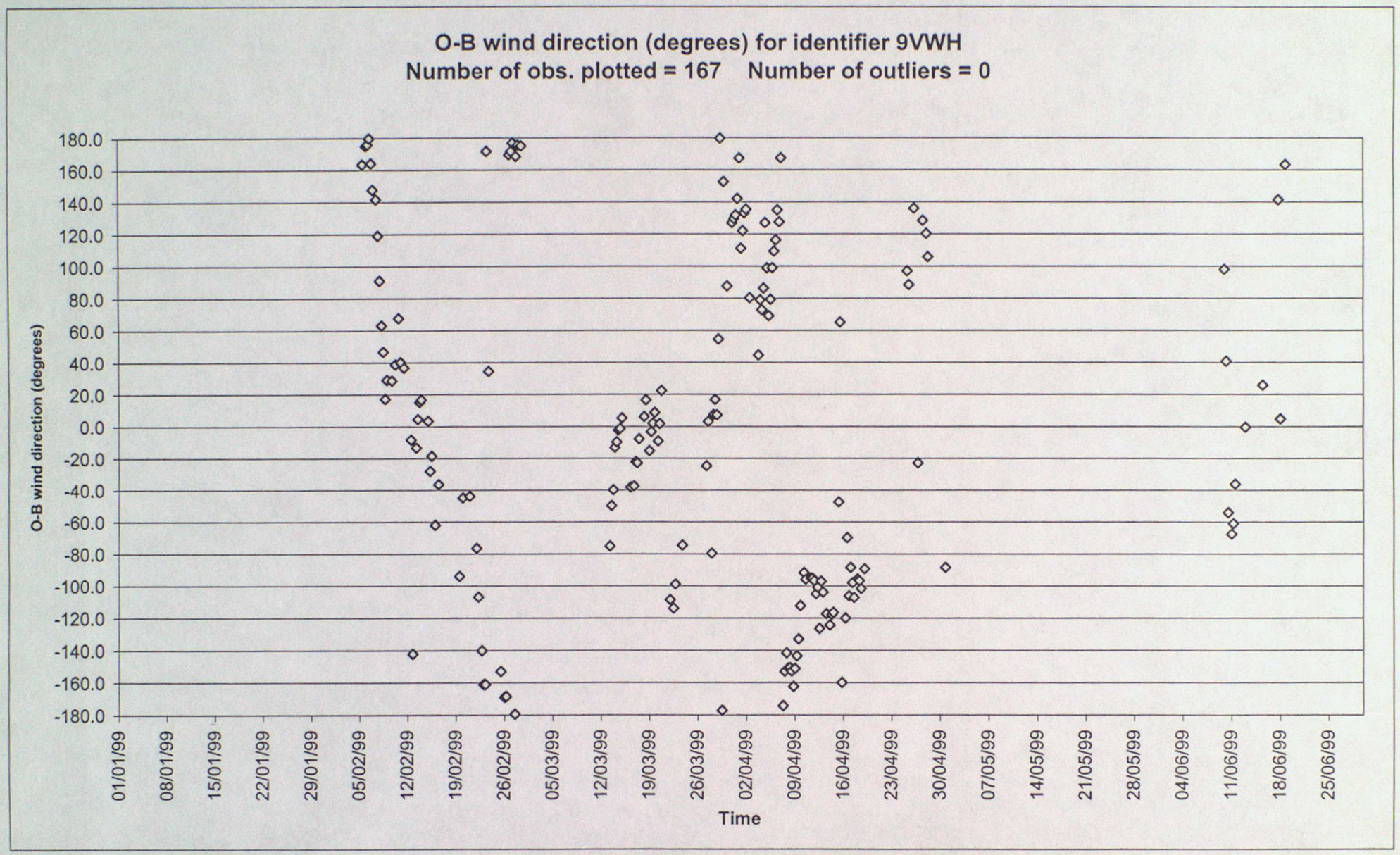
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time


O-B wind direction (degrees) for identifier 9VWH
Number of obs. plotted = 167 Number of outliers = 0
O-B wind direction (degrees)
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
01/01/99
08/01/99
15/01/99
22/01/99
29/01/99
05/02/99
12/02/99
19/02/99
26/02/99
05/03/99
12/03/99
19/03/99
26/03/99
02/04/99
09/04/99
16/04/99
23/04/99
30/04/99
07/05/99
14/05/99
21/05/99
28/05/99
04/06/99
11/06/99
18/06/99
25/06/99
Time